The Harman Kardon Model hk 560

AM/FM/Stereo FM Solid State Receiver

Technical Manual

harman/kardon

PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.

2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.

3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.

4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.

5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistor failure.

6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.

7. Fuses must be replaced with size and type indicated. Use of other types can expose components to destructive current levels.

NOTE TO WARRANTY STATIONS: Printed circuit board assembly numbers are shown for reference only. Harman/Kardon does not normally supply assembled printed circuit boards.

NOTE: To speed handling of your order be sure to include both the model and serial numbers, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman/Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman/Kardon, 55 Ames Court, Plainview, L. I., N. Y. 11803, Att: Parts Department.

ALIGNMENT PROCEDURES

AM ALIGNMENT PROCEDURES

INSTRUMENTS REQUIRED:
*AM Signal Generator modulated with 400Hz at 30%.
*AM IF Sweep Generator.
*Oscilloscope
*V. T. V. M.

NOTE:
*Set function selector switch to AM position.
*Connect signal to Standard Loop so as to radiate signals into AM antenna loop stick (L251).

Step	SIGNAL SOURCE		CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
	GENERATOR	FREQUENCY				
1	AM IF sweep generator	455 kHz	V. T. V. M. and oscilloscope to R267 (4.7 k ohm)	Quiet Point on band	T251	Maximum output and best symmetry on oscilloscope
2					T252	
3	Rotate tuning control to extreme left mechanical stop, and check for dial pointer at center of "0" on log scale.					
4	Repeat steps 1 and 2 for best sensitivity.					
5	AM signal generator	600 kHz	V. T. V. M. and oscilloscope to R267 (4.7 k ohm)	600 kHz	L252	Maximum output
6		1400 kHz		1400 kHz	TC202	
7	Repeat steps 4 and 5 for best dial accuracy.					
8	AM signal generator	600 kHz	V. T. V. M. and oscilloscope to R267 (4.7 k ohm)	600 kHz	L251	Maximum output
9		1400 kHz		1400 kHz	TC201	
10	Repeat steps 7 and 8 for best sensitivity.					

TUNING METER ADJUSTMENT

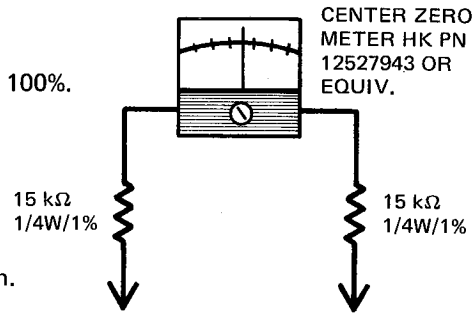
INSTRUMENTS REQUIRED:
*FM Signal Generator modulated with 1000Hz at 100%.
*Oscilloscope.
*V. T. V. M..

NOTE:
*Set function selector switch to FM position.
*Connect signal source to FM antenna terminals.

Step	SIGNAL SOURCE		CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
	FREQUENCY	STRENGTH				
1	98 MHz	2 μV (6 dB)	V. T. V. M. and oscilloscope to tape out 1 jack	Near 98 MHz	Tuning control	Maximum tuning meter indication
2		1 mV (60 dB)		Preset point	VR201	Indicating 9 on tuning meter

FM ALIGNMENT PROCEDURES

INSTRUMENTS REQUIRED:
- *FM Signal Generator modulated with 1000Hz at 100%.
- *Oscilloscope.
- *Distortion Meter.
- *Center Zero Meter (Described at right).
- *V. T. V. M..



NOTE:
- *Set function selector switch to FM position.
- *Set FM muting switch to OFF (button out) position.
- *Connect signal source to FM antenna terminals.

Step	SIGNAL SOURCE FREQUENCY	SIGNAL SOURCE STRENGTH	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1			Oscilloscope to R217 (10 k ohm)	Quiet Point on band	T101	Maximum noise
2			Center zero meter to R214 (47 k ohm) and LP108		T201	Indicating zero on center zero meter
3	98 MHz	1 μV (60 dB)	Oscilloscope to tape out 1 jack	Near 98 MHz	Tuning control	
4			Distortion meter to tape out 1 jack	Preset point	T202	Minimum reading on distortion meter
5	Repeat steps 2 through 4 until no further improvement is noticed.					
6	90 MHz	2 μV (6 dB)	V. T. V. M. and oscilloscope to tape out 1 jack	90 MHz	L105	Maximum output
7	106 MHz			106 MHz	TC103	
8	Repeat setps 6 and 7 until no further improvement is noticed.					
9	90 MHz	1 μV (0 dB)	V. T. V. M. and oscilloscope to tape out 1 jack	90 MHz	L102, L103	Maximum output
10	106 MHz			106 MHz	TC101, TC102	
11	Repeat steps 9 and 10 until no further improvement is noticed.					

IN TUNE INDICATOR BANDWIDTH AND MUTING SENSITIVITY ADJUSTMENTS

INSTRUMENTS REQUIRED:
*FM Signal Generator modulated with 1000Hz at 100%.
*Oscilloscope.
*V. T. V. M..
*Frequency Counter

NOTE:
*Set function selector switch to FM position.
*Set FM muting switch to ON (button in) position.
*Connect signal source to FM antenna terminals.

Step	SIGNAL SOURCE		CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
	FREQUENCY	STRENGTH				
1	98 MHz	50 μV (6 dB)	V. T. V. M. and oscilloscope to tape out 1 jack	Near 98 MHz	Tuning control	Maximum tuning meter indication
2		3.16 μV (10 dB)		Preset point	VR203	In tune indicator lights and output appears on oscilloscope
3		1 mV (60 dB)	V. T. V. M. and oscilloscope to tape out 1 jack		FM signal generator	Increase generator frequency until signal disappears from oscilloscope and note frequency on counter
4						Decrease generator frequency until signal disappears from oscilloscope and note frequency on counter
5					VR202	Repeat steps 3 and 4, and adjust until the difference of frequencies from step 3 and 4 becomes 125 k Hz ±15 k Hz

FM STEREO INDICATOR ADJUSTMENT

INSTRUMENTS REQUIRED:
*FM Stereo Signal Generator.
*Oscilloscope.
*V. T. V. M..

NOTE:
*Set function selector switch to STEREO FM position.
*Connect signal source to FM antenna terminals.
*Set main signal OFF and Pilot signal (10%) ON of FM Stereo signal generator.

Step	SIGNAL SOURCE		CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
	FREQUENCY	STRENGTH				
1	98 MHz	2 μV (6 dB)	V. T. V. M. and oscilloscope to tape out 1 jack	Near 98 MHz	Tuning control	Maximum tuning meter indication
2		25 μV (28 dB)		Preset point	VR204	FM stereo indicator lights

SEPARATION ADJUSTMENT

INSTRUMENTS REQUIRED: *FM Stereo Signal Generator.
*Oscilloscope
*V. T. V. M..

NOTE: *Set function selector switch to STEREO FM position.
*Connect signal source to FM antenna terminals.

Step	SIGNAL SOURCE FREQUENCY	SIGNAL SOURCE STRENGTH	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1	Set main signal OFF and pilot signal (10%) ON of FM stereo signal generator.					
2	98 MHz	2 μV (6 dB)	V. T. V. M. and oscilloscope to tape out 1 jack	Near 98 MHz	Tuning control	Maximum tuning meter indication
3		1 mV (60 dB)	V. T. V. M. to Rch tape out 1 jack	Preset point	VR302	Minimum output; Compromise so that left minimum = right minimum ±3dB
4			V. T. V. M. to Lch tape out 1 jack		VR302	
5	Set main signal ON and pilot signal (10%) ON of FM stereo signal generator.					
6	98 MHz (Right signal)	1 mV (60 dB)	V. T. V. M. to Lch tape out 1 jack	Preset point	VR303	Minimum output; Compromise so that left minimum = right minimum ±3dB
7	98 MHz (Left signal)		V. T. V. M. to Rch tape out 1 jack		VR303	

MPX OSCILLATION FREQUENCY ADJUSTMENT

INSTRUMENTS REQUIRED: *Frequency Counter.
*FM Signal Generator.
*Oscilloscope.
*V. T. V. M..

NOTE: *Set function selector switch to STEREO FM position.
*Connect signal source to FM antenna terminals.

Step	SIGNAL SOURCE FREQUENCY	SIGNAL SOURCE STRENGTH	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1	98 MHz	2 μV (6 dB)	V. T. V. M. and oscilloscope to tape out 1 jack	Near 98 MHz	Tuning control	Maximum tuning meter indication
2	98 MHz/Mono (No modulation)	1 mV (60 dB)	Frequency Counter to R333 (100 k ohm)	Preset point	VR301	76 kHz ±200 Hz

OUTPUT DC VOLTAGE ZERO ADJUSTMENT

INSTRUMENT: *D. C. V. T. V. M.

NOTE: *Set function selector switch to AUX position.
*Set volume control to minimum position.
*Set Speaker 1 switch to ON (button in) position.

Step	CONNECT OUTPUT METER TO	ADJUST	ADJUST FOR
1	D. C. V. T. V. M. to Rch terminal of speaker system 1	VR401	0 ± 10mVDC
2	D. C. V. T. V. M. to Lch terminal of speaker system 1	VR402	

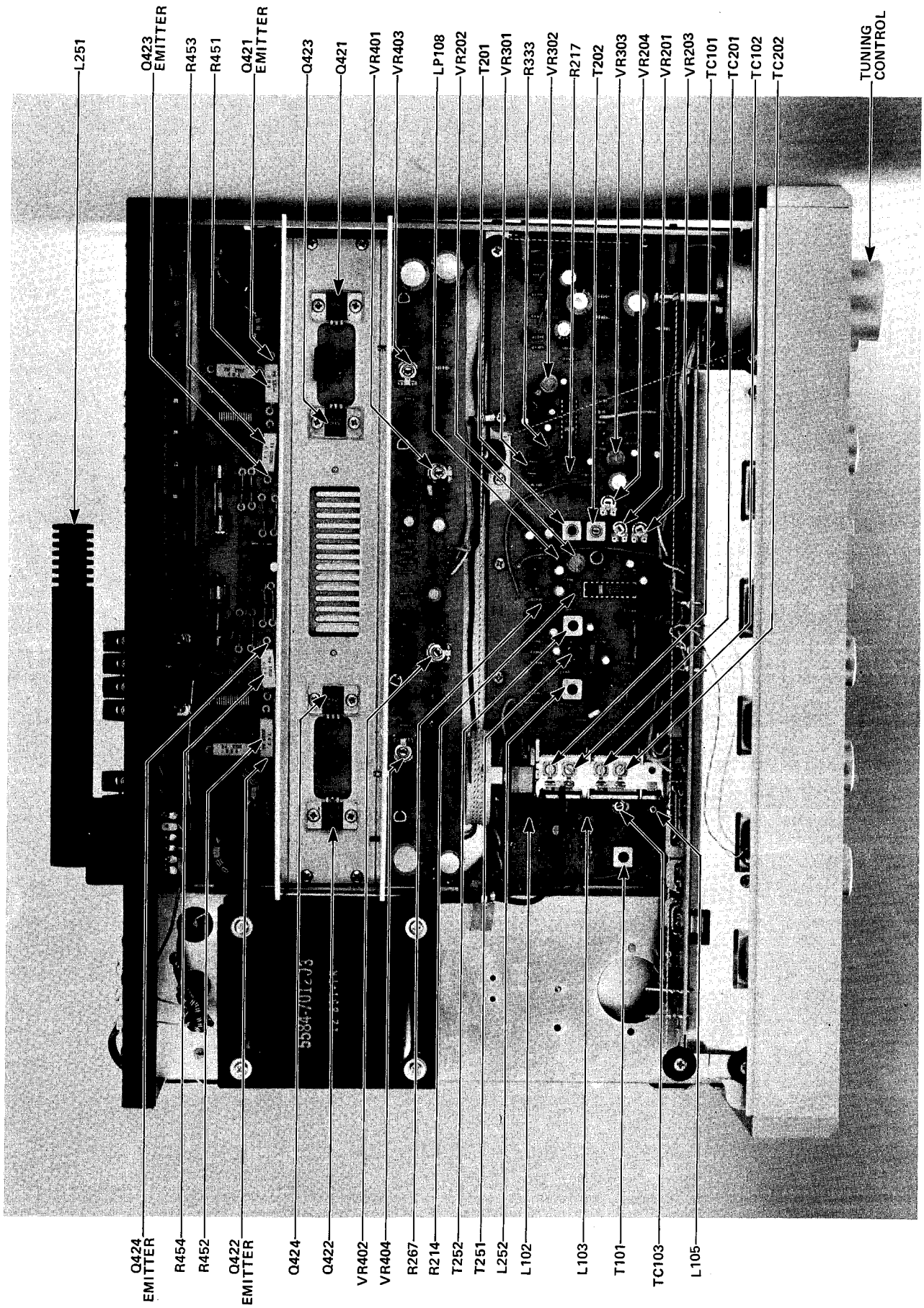
POWER AMPLIFIER IDLING ADJUSTMENT

INSTRUMENT: *D. C. V. T. V. M.

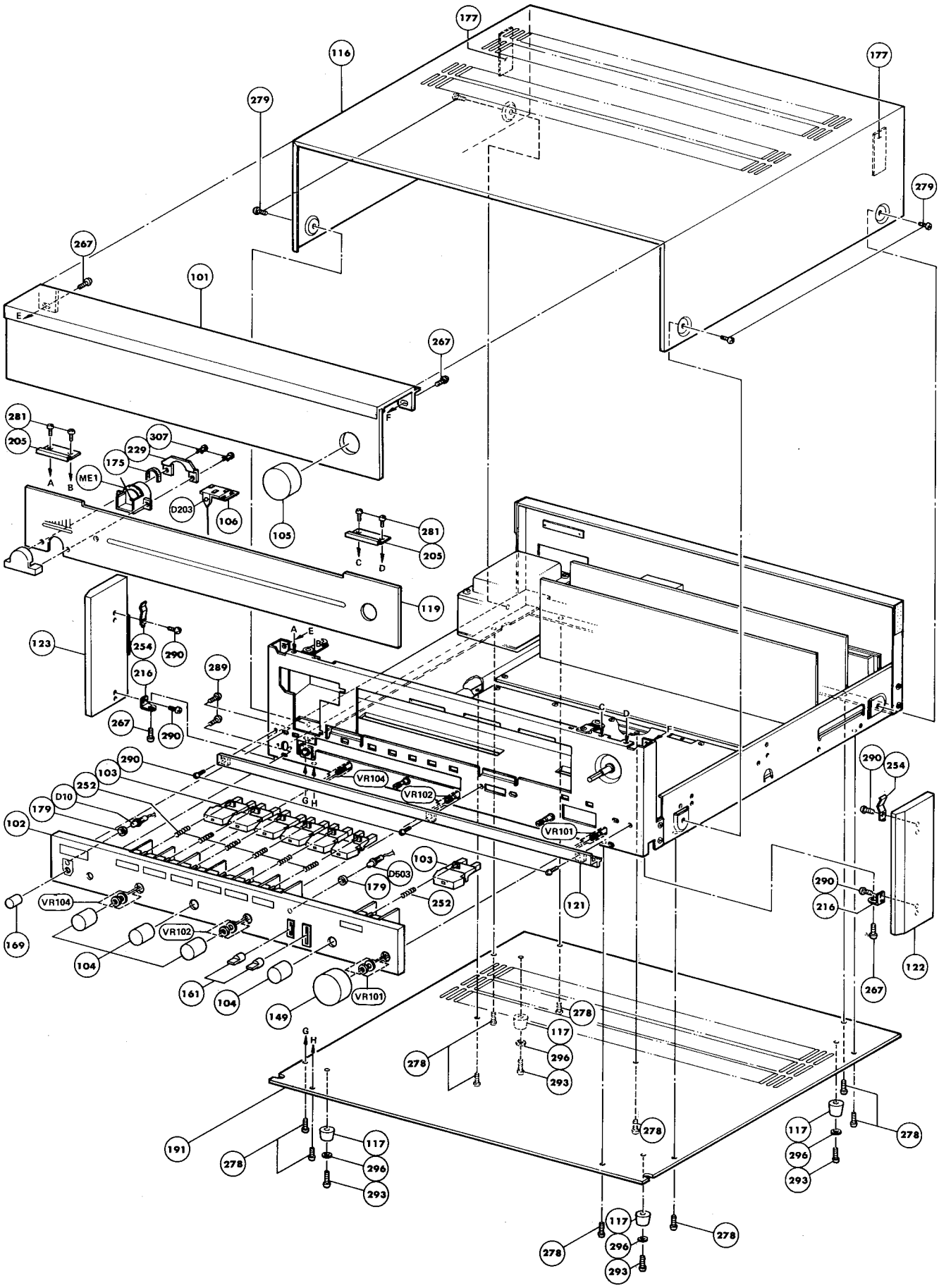
NOTE: *Set function selector switch ot AUX position.
*Set volume control to minimum position.

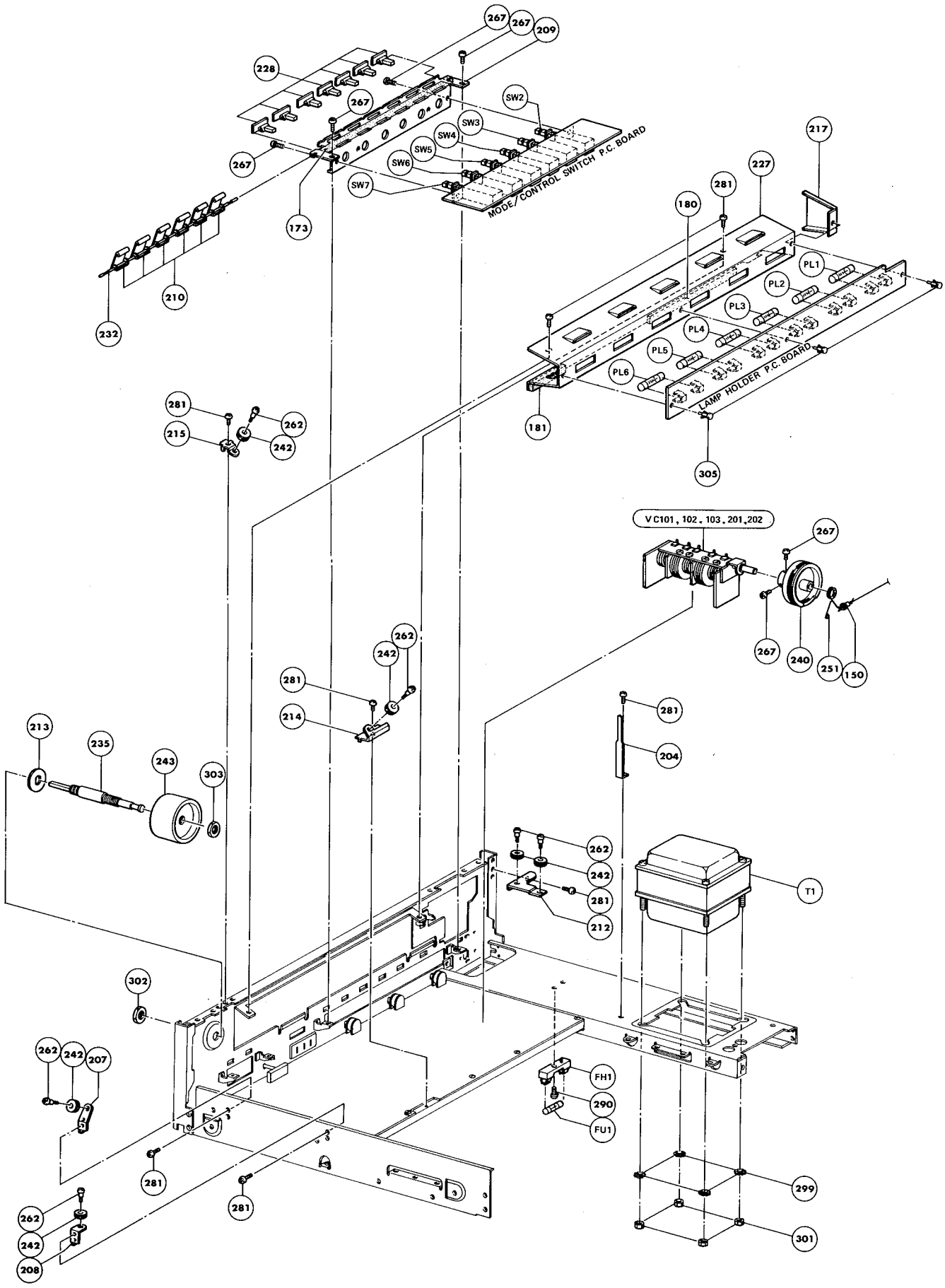
Step	CONNECT OUTPUT METER TO	ADJUST	ADJUST FOR
1	D. C. V. T. V. M. to Q421 (emitter) and Q423 (emitter)	VR403	33 mV ± 1.6 mV
2	D. C. V. T. V. M. to Q422 (emitter) and Q424 (emitter)	VR404	

ALIGNMENT POINTS



GENERAL UNIT EXPLODED VIEW

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267
209
228
267
SW2
SW3
SW4
SW5
SW6
SW7
MODE/CONTROL SWITCH P.C. BOARD
267
173
210
232
217
227
281
180
PL1
PL2
PL3
PL4
PL5
PL6
LAMP HOLDER P.C. BOARD
181
305
281
215
262
242
VC101, 102, 103, 201, 202
267
267
240
251
150
262
242
281
214
213
235
243
303
281
204
262
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T1
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FU1
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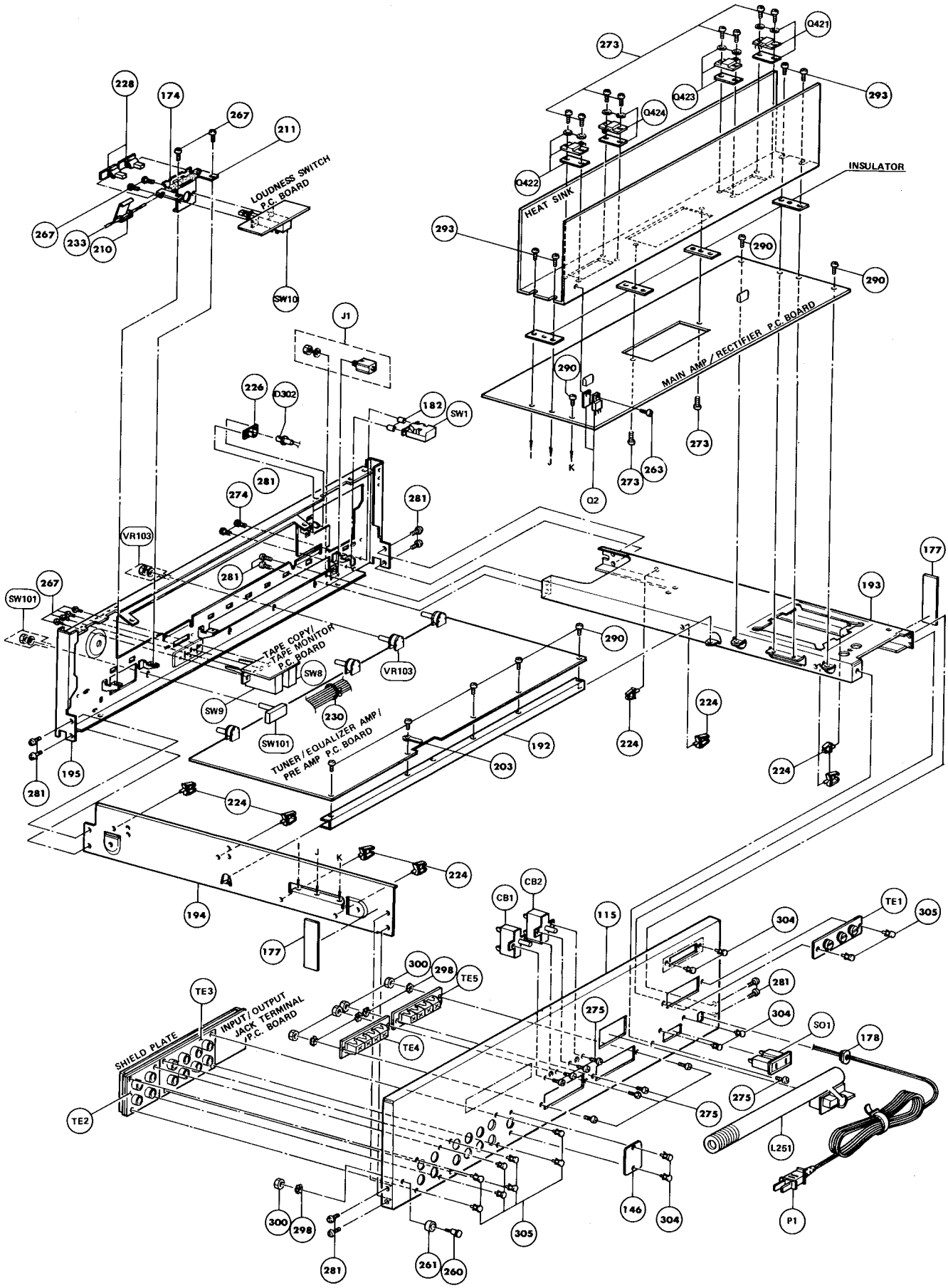
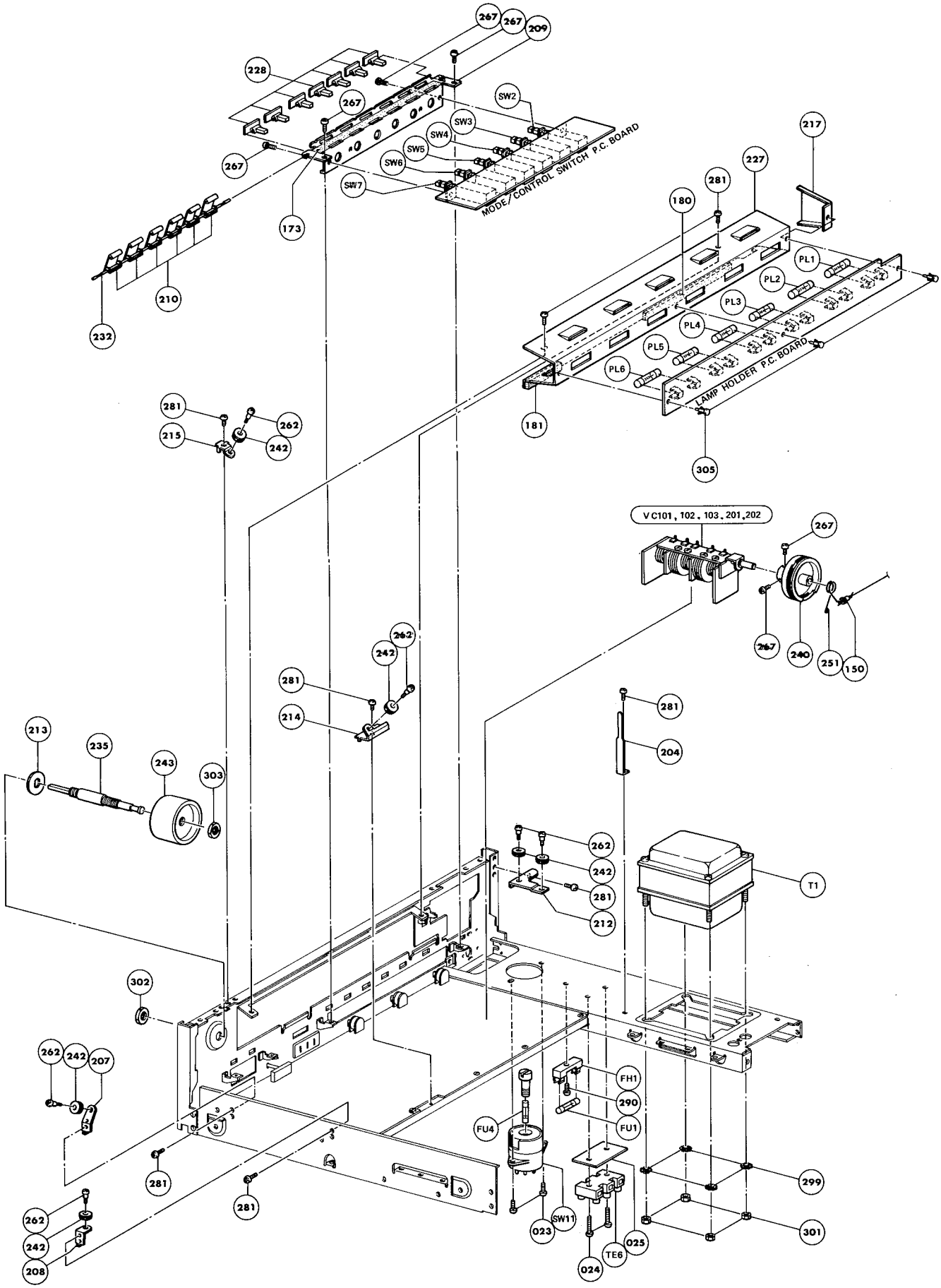

LOUDNESS SWITCH P.C. BOARD
HEAT SINK
INSULATOR
MAIN AMP / RECTIFIER P.C. BOARD
TAPE COPY/ TAPE MONITOR P.C. BOARD
TUNER / EQUALIZER AMP / PRE AMP P.C. BOARD
INPUT/ OUTPUT JACK TERMINAL P.C. BOARD
SHIELD PLATE
J
K

MULTI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SW2
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MODE/CONTROL SWITCH P.C. BOARD
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180
PL1
PL2
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PL4
PL5
PL6
LAMP HOLDER P.C. BOARD
181
305
281
215
262
242
VC101, 102, 103, 201, 202
267
267
240
251
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214
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235
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303
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212
T1
302
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FH1
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FU1
FU4
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SW11
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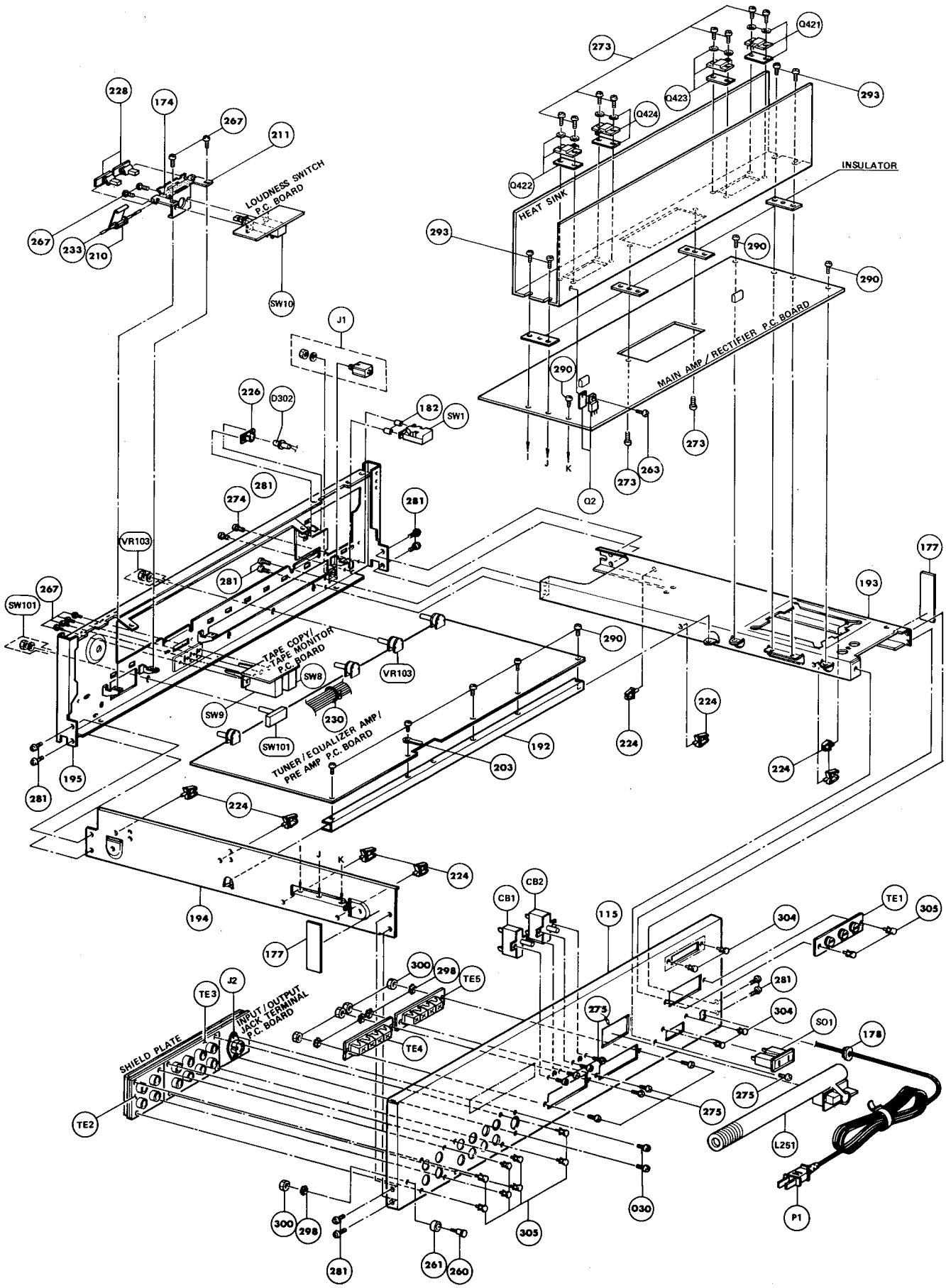
TE6
024


LOUDNESS SWITCH P.C. BOARD
HEAT SINK
INSULATOR
MAIN AMP / RECTIFIER P.C. BOARD
TAPE COPY/ TAPE MONITOR P.C. BOARD
TUNER / EQUALIZER AMP / PRE AMP P.C. BOARD
INPUT / OUTPUT JACK TERMINAL P.C. BOARD
SHIELD PLATE
228
174
267
211
233
210
SW10
J1
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D302
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SW1
281
274
VR103
SW101
SW8
SW9
230
192
203
195
224
194
177
CB1
CB2
115
304
TE1
305
300
298
TE5
TE3
J2
TE4
TE2
275
SO1
178
L251
P1
030
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Q421
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Q423
Q424
Q422
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263
Q2
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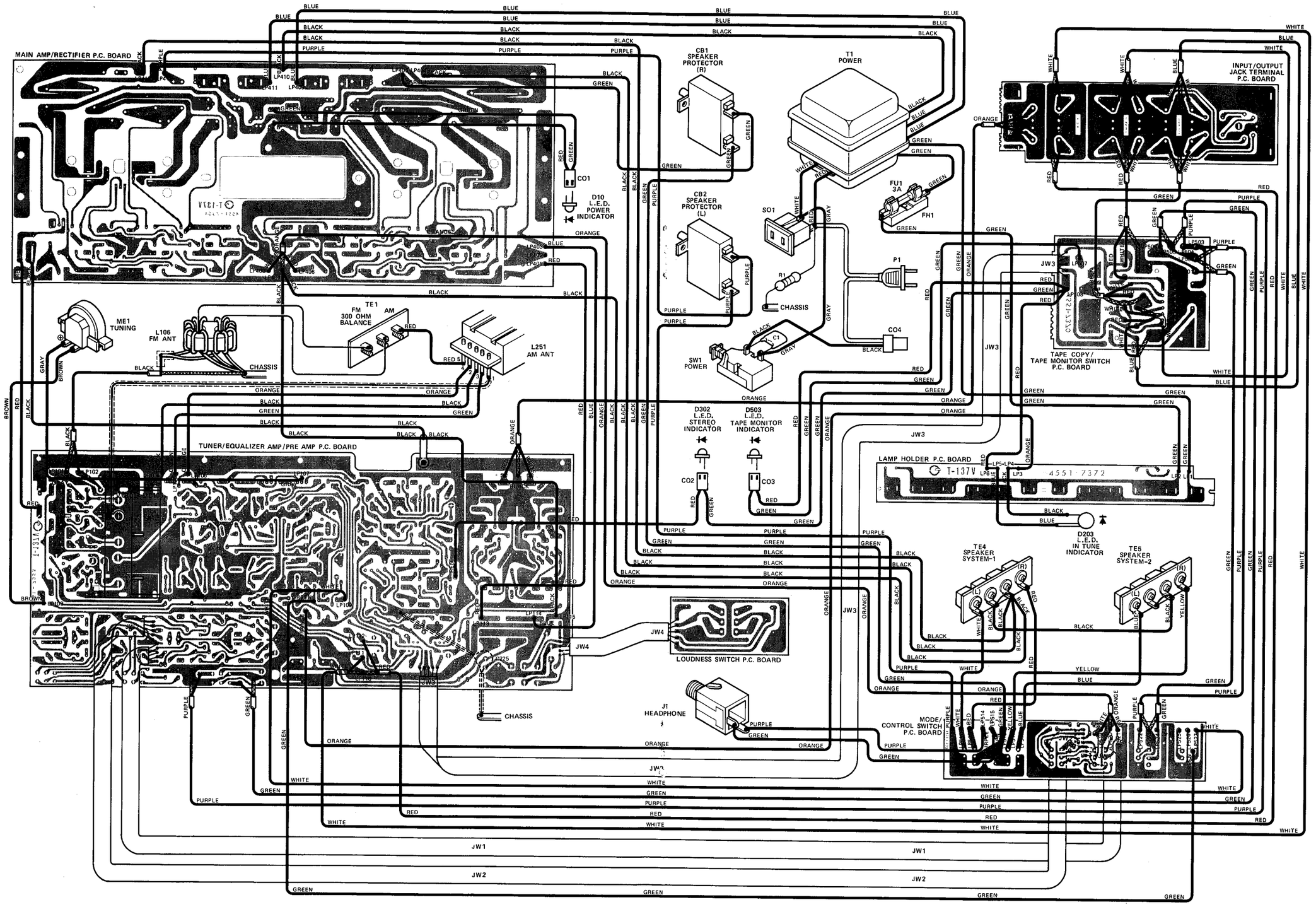
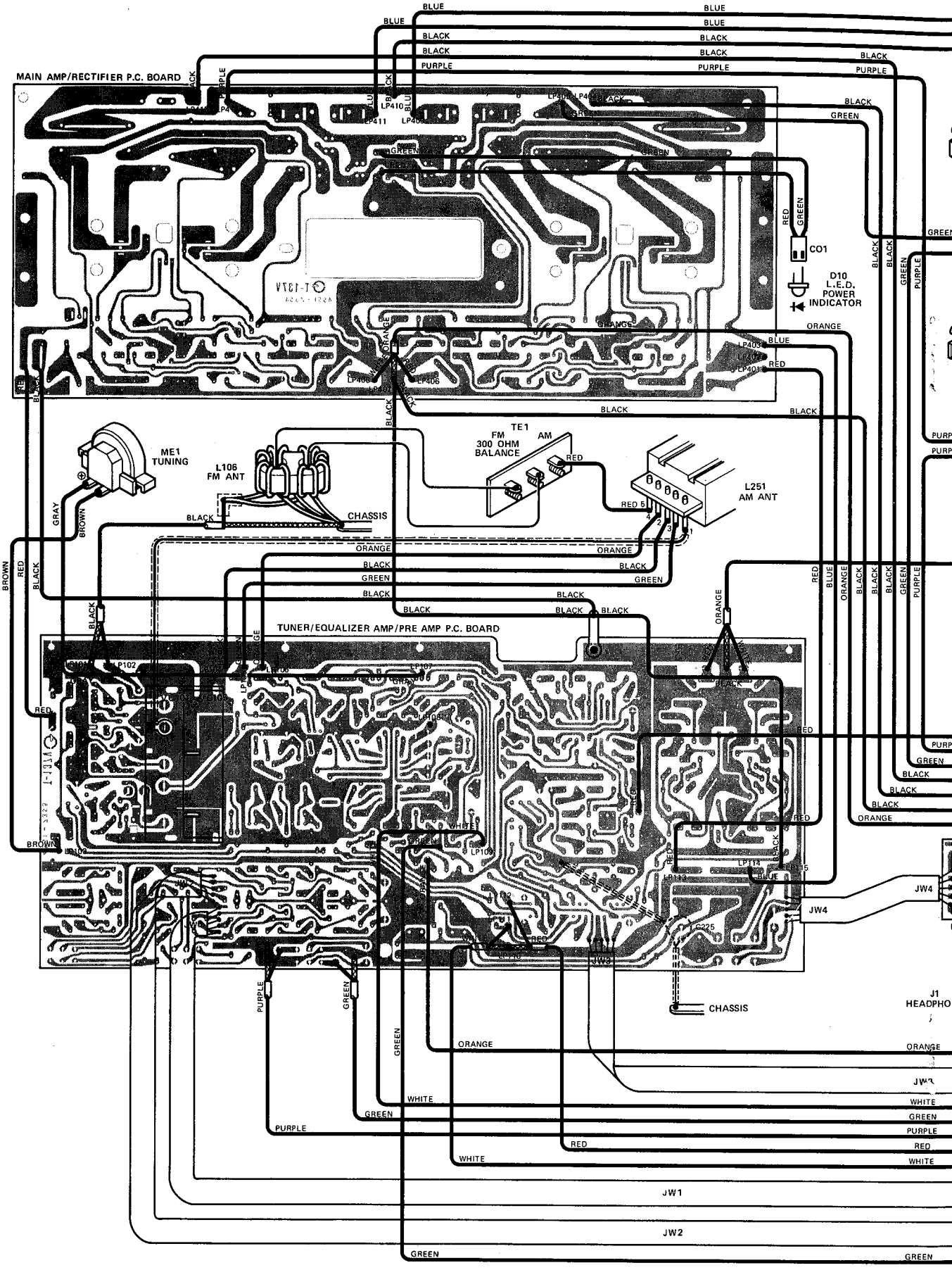
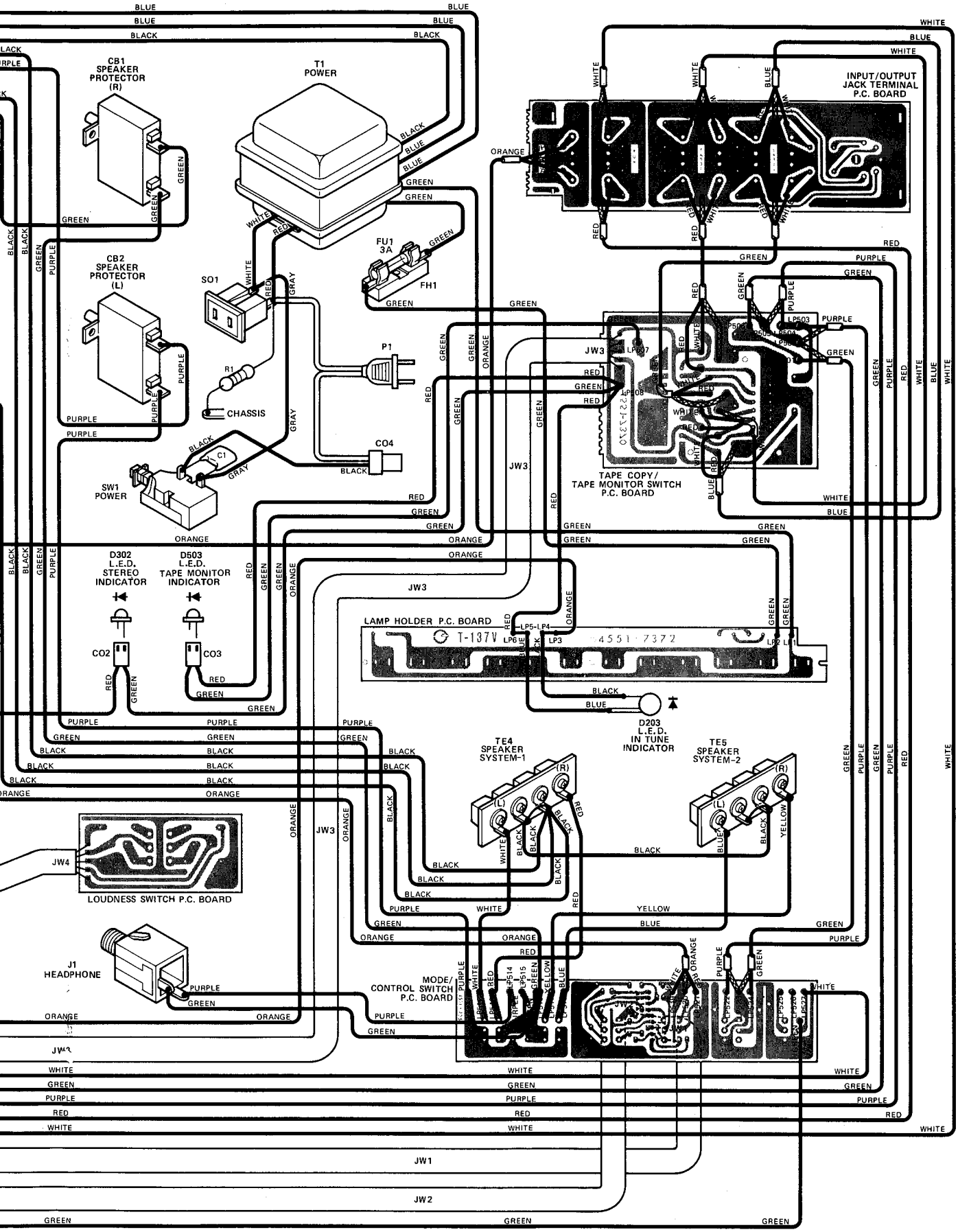
224

WIRING DIAGRAM

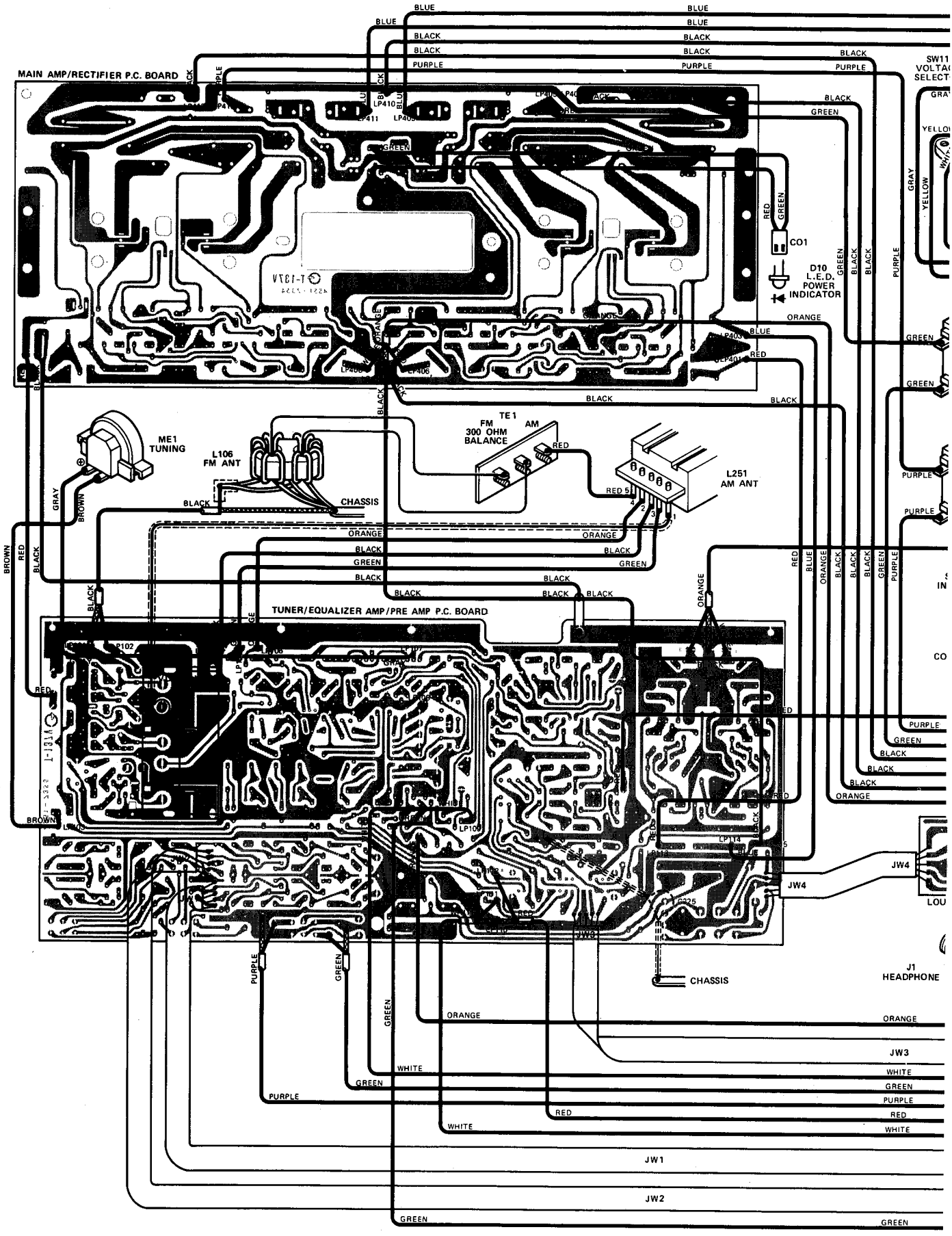


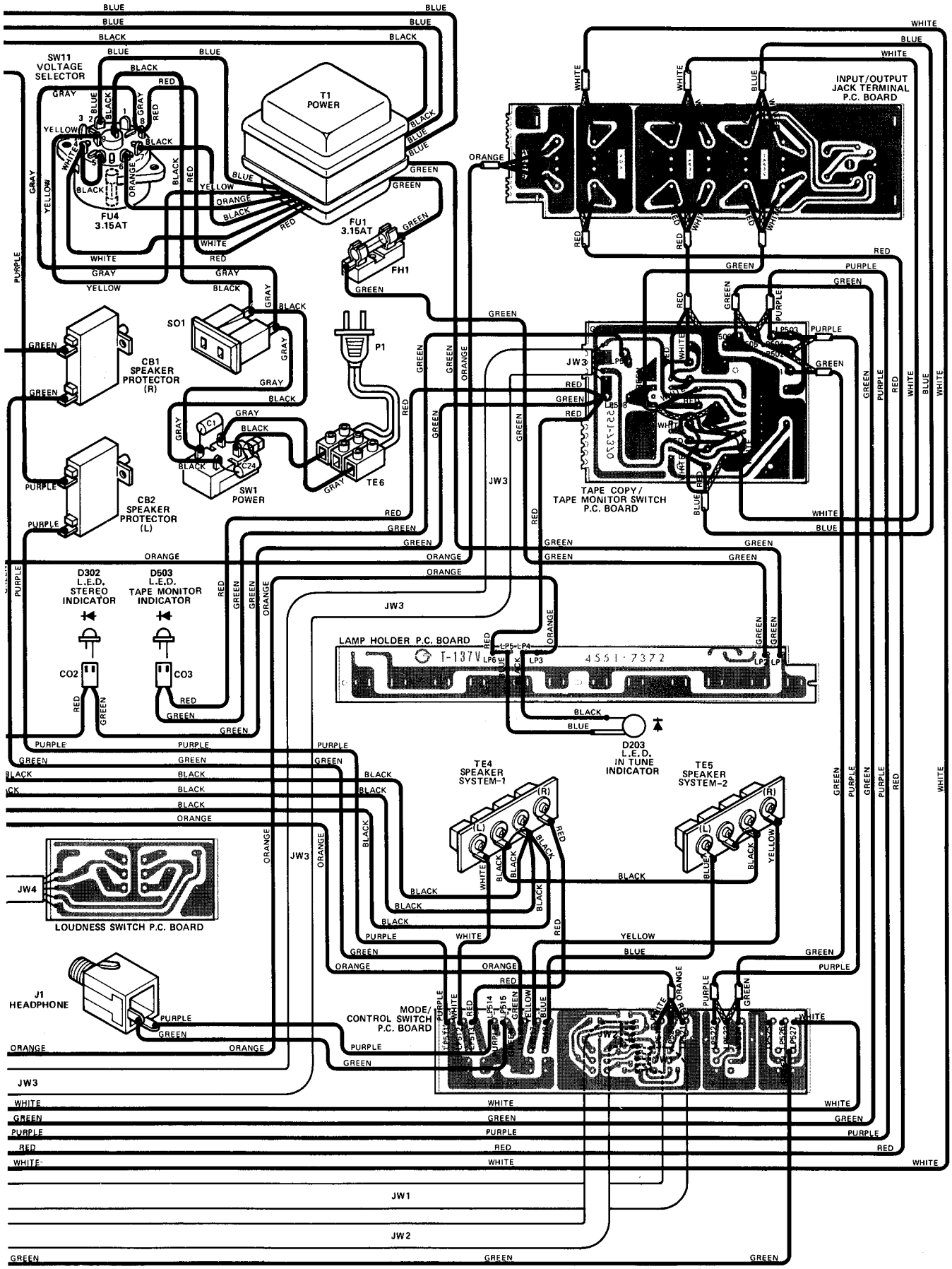
WIRING DIAGRAM




CB1
SPEAKER
PROTECTOR
(R)
T1
POWER
CB2
SPEAKER
PROTECTOR
(L)
SO1
FU1
3A
FH1
P1
R1
CHASSIS
C04
SW1
POWER
C1
INPUT/OUTPUT
JACK TERMINAL
P.C. BOARD
TAPE COPY/
TAPE MONITOR SWITCH
P.C. BOARD
JW3
D302
L.E.D.
STEREO
INDICATOR
D503
L.E.D.
TAPE MONITOR
INDICATOR
CO2
CO3
LAMP HOLDER P.C. BOARD
D203
L.E.D.
IN TUNE
INDICATOR
TE4
SPEAKER
SYSTEM-1
TE5
SPEAKER
SYSTEM-2
JW4
LOUDNESS SWITCH P.C. BOARD
J1
HEADPHONE
MODE/
CONTROL SWITCH
P.C. BOARD
JW1
JW2

WIRING DIAGRAM
MULTI

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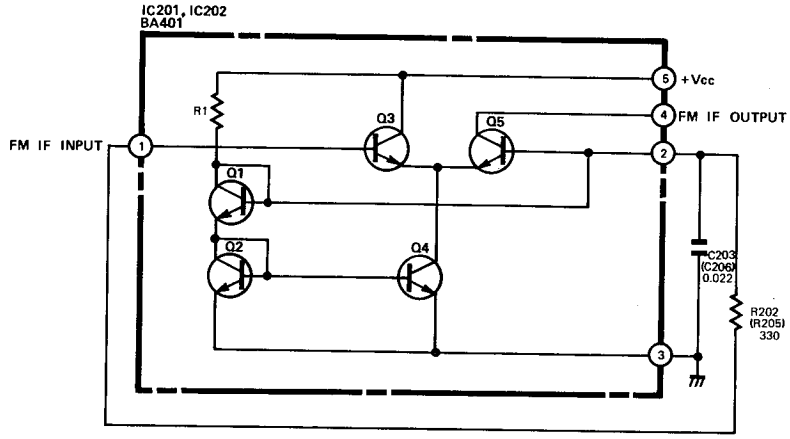
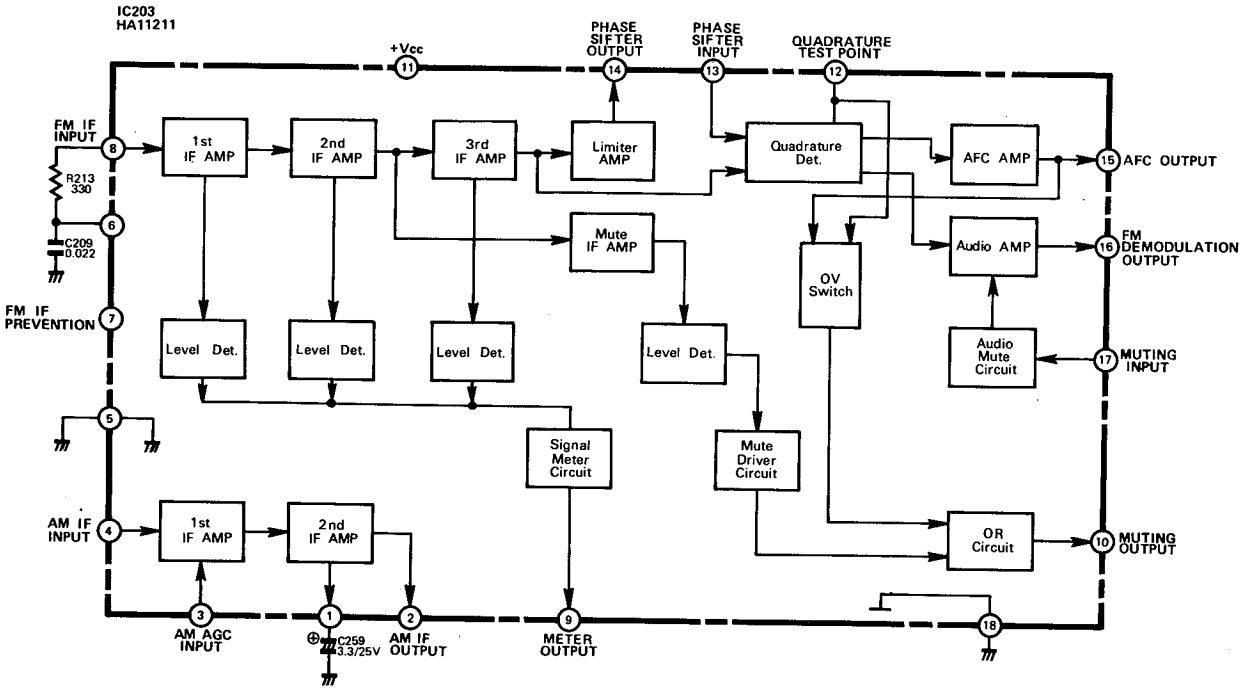
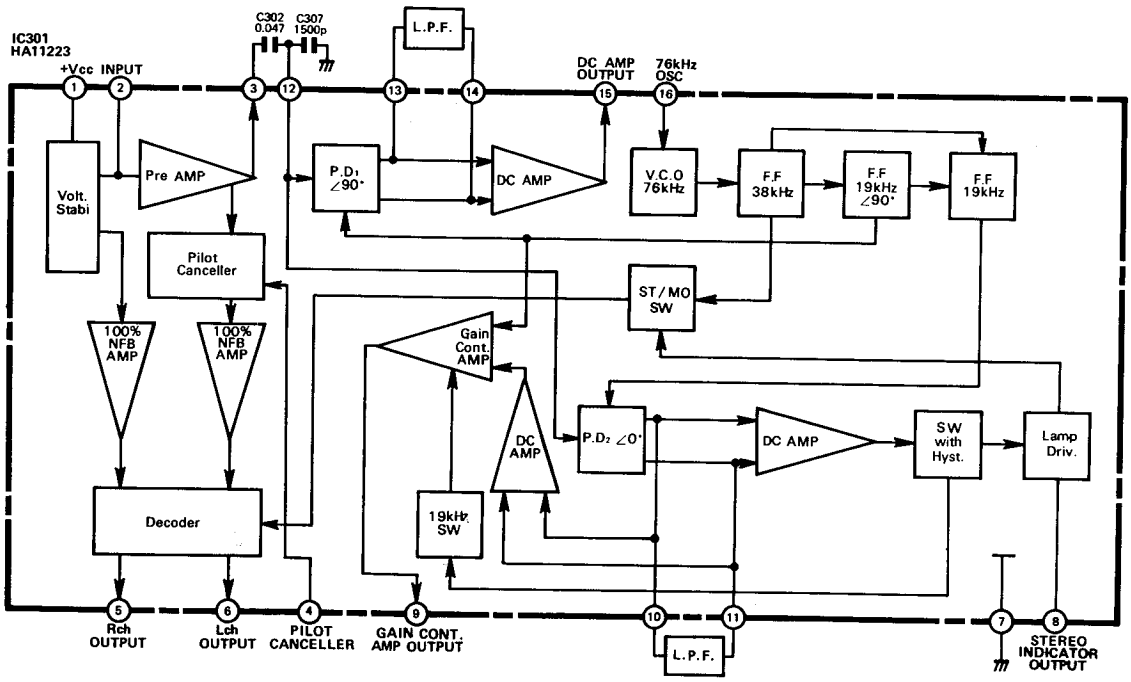
VOLTAGE
SELECTOR
T1
POWER
FU4
3.15AT
FU1
3.15AT
FH1
INPUT/OUTPUT
JACK TERMINAL
P.C. BOARD
CB1
SPEAKER
PROTECTOR
(R)
CB2
SPEAKER
PROTECTOR
(L)
SO1
P1
SW1
POWER
TE6
JW3
TAPE COPY/
TAPE MONITOR SWITCH
P.C. BOARD
D302
L.E.D.
STEREO
INDICATOR
D503
L.E.D.
TAPE MONITOR
INDICATOR
CO2
CO3
LAMP HOLDER P.C. BOARD
T-137V
4551-7372
D203
L.E.D.
IN TUNE
INDICATOR
TE4
SPEAKER
SYSTEM-1
TE5
SPEAKER
SYSTEM-2
JW4
LOUDNESS SWITCH P.C. BOARD
J1
HEADPHONE
MODE/
CONTROL SWITCH
P.C. BOARD
JW1
JW2

IC BLOCK DIAGRAM







SCHEMATIC DIAGRAM
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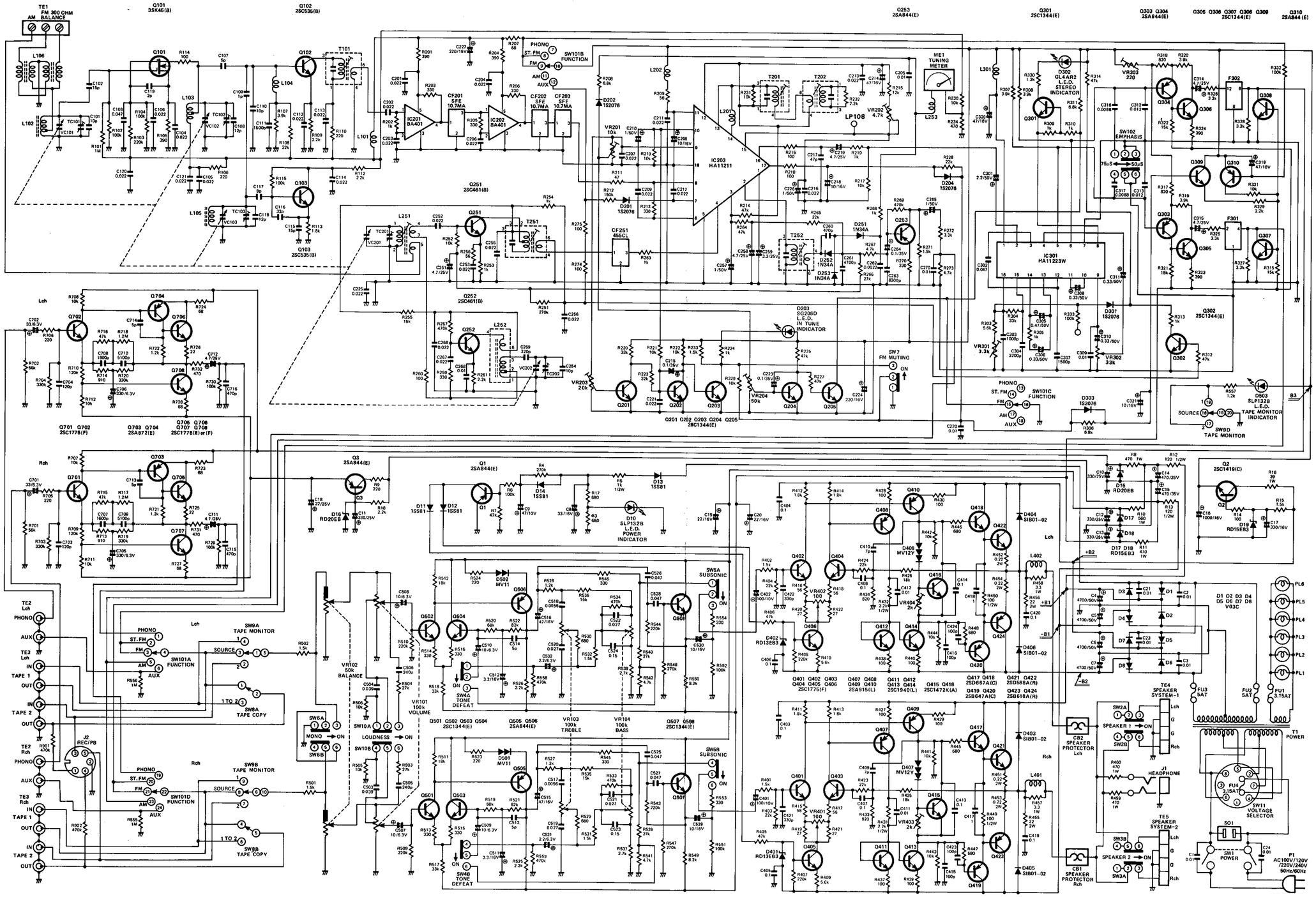

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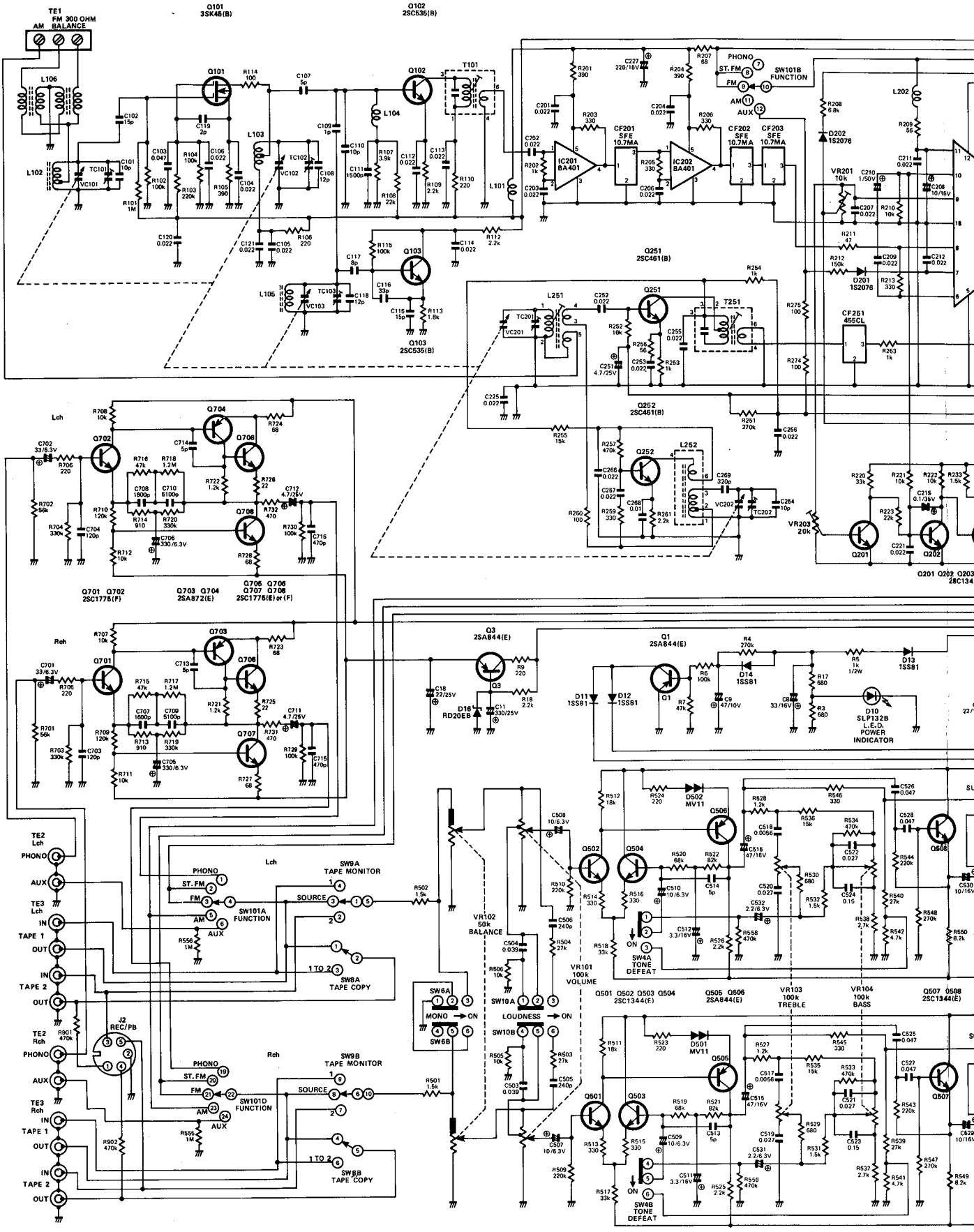
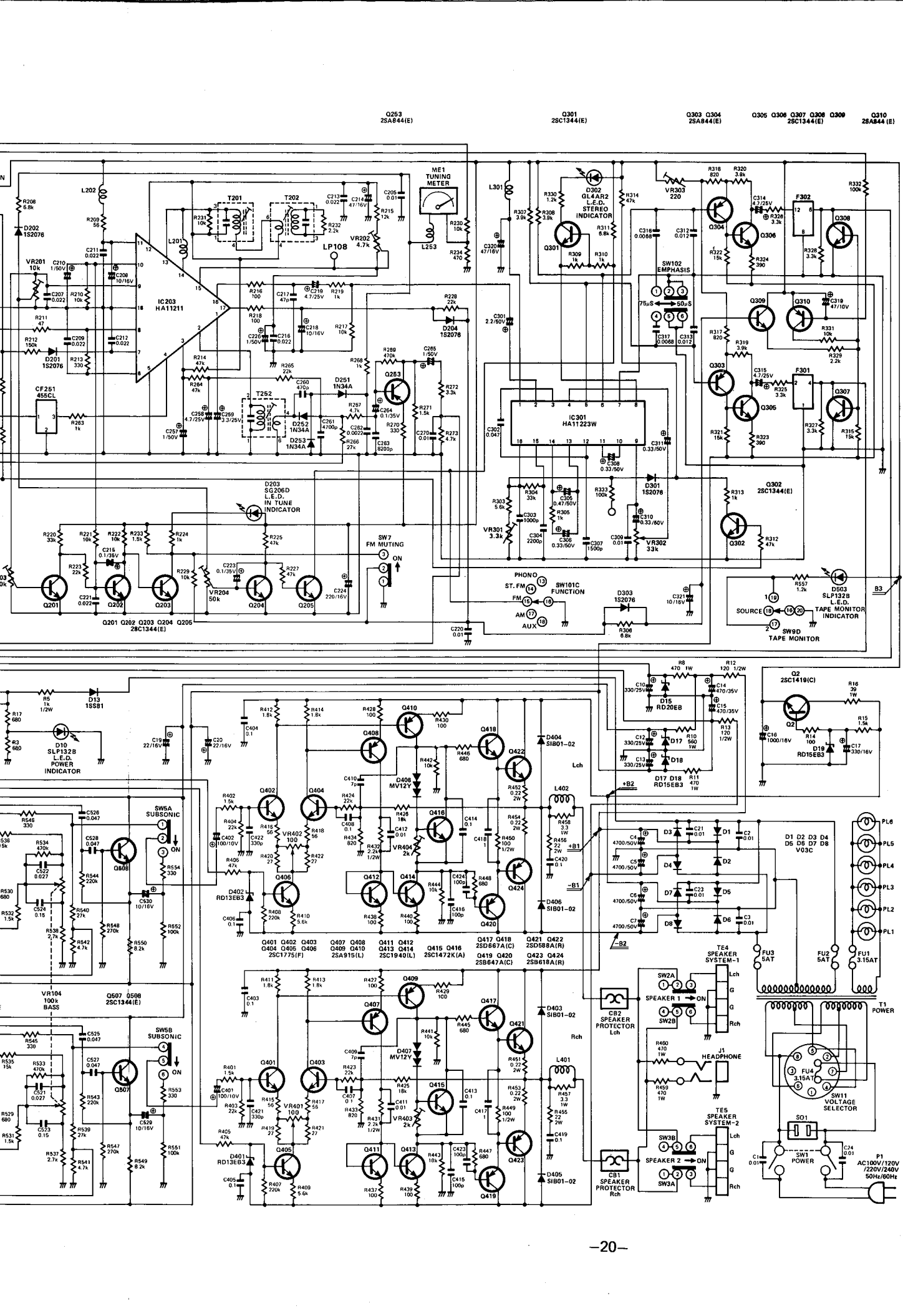
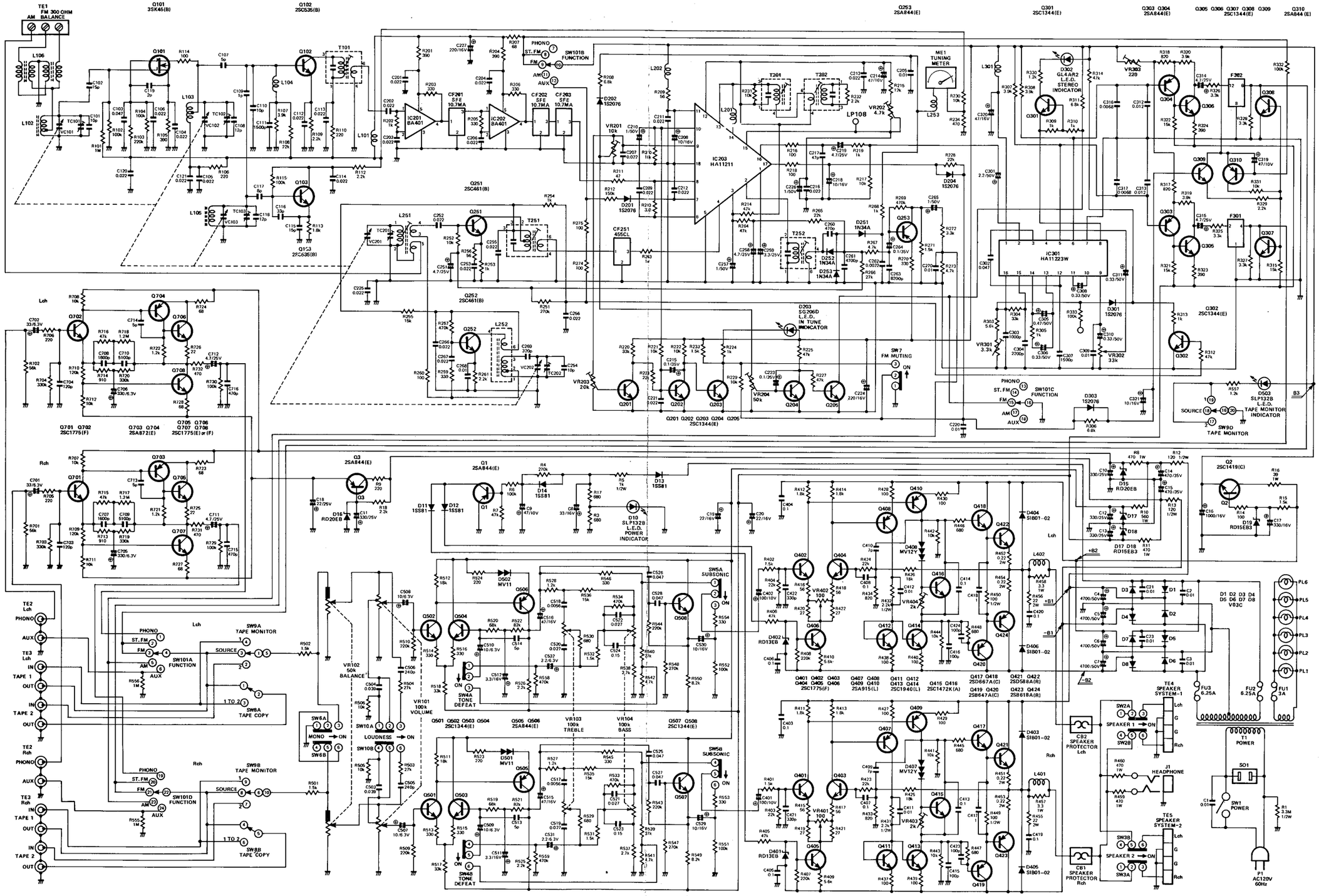
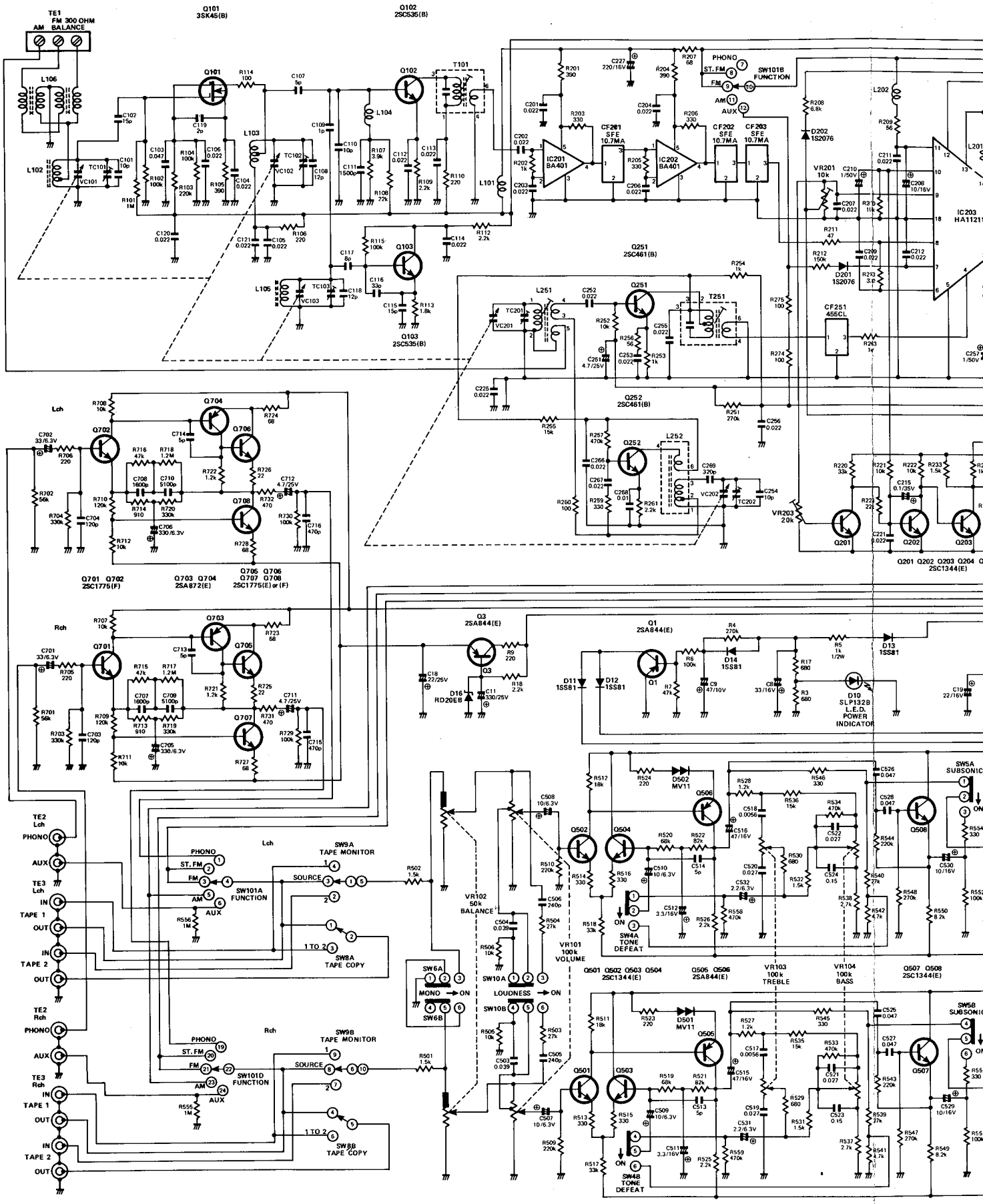


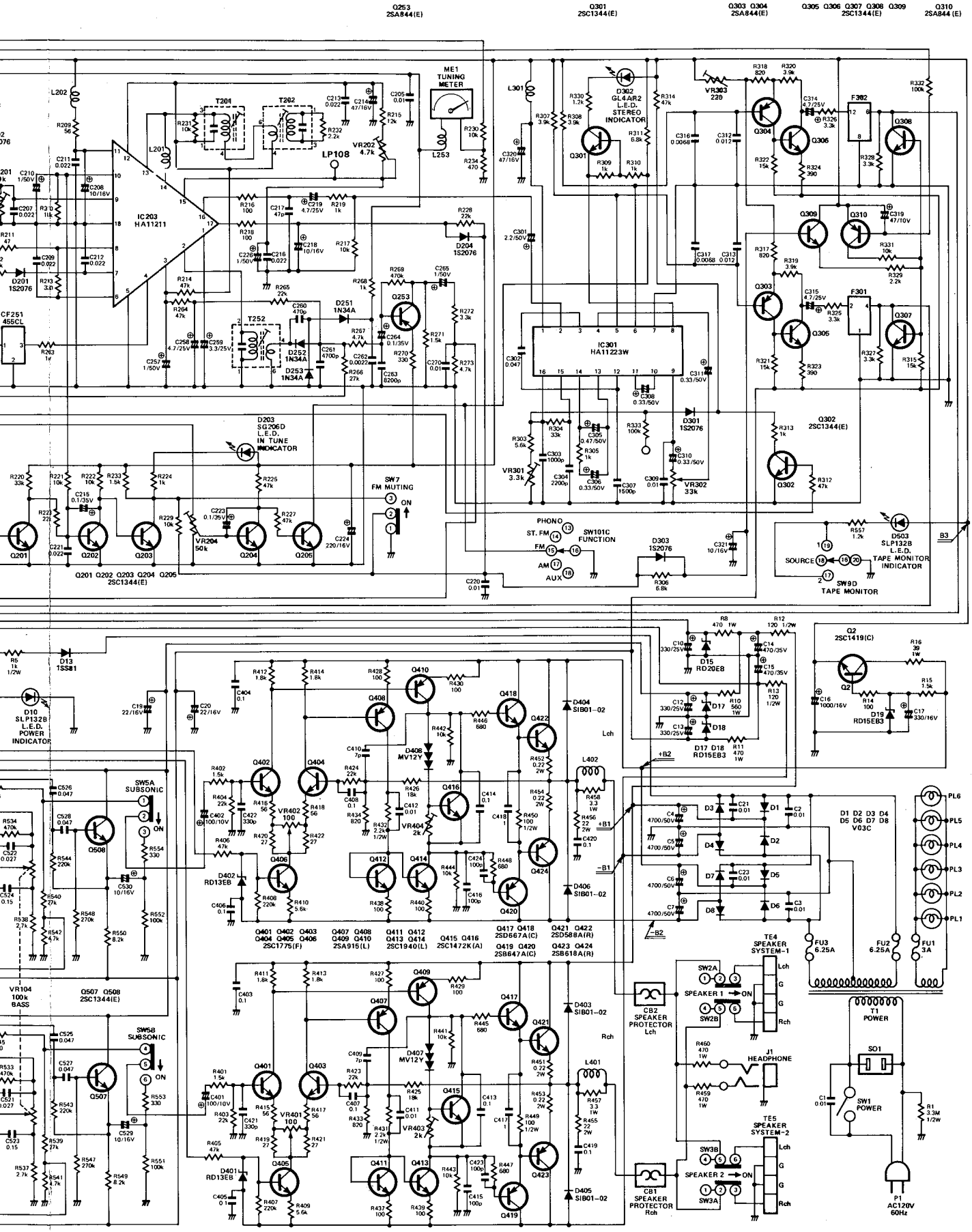

Q253 2SA844(E)
Q301 2SC1344(E)
Q303 Q304 2SA844(E)
Q305 Q306 Q307 Q308 Q309 2SC1344(E)
Q310 2SA844 (E)
ME1 TUNING METER
IC203 HA11211
IC301 HA11223W
D203 SG206D L.E.D. IN TUNE INDICATOR
SW7 FM MUTING
PHONO
ST. FM
FM
AM
AUX
SW101C FUNCTION
SOURCE
TAPE MONITOR INDICATOR
SW9D TAPE MONITOR
D10 SLP132B L.E.D. POWER INDICATOR
Q201 Q202 Q203 Q204 Q205 2SC1344(E)
Q401 Q402 Q403 Q404 Q405 Q406 2SC1775(F)
Q407 Q408 Q409 Q410 2SA915(L)
Q411 Q412 Q413 Q414 2SC1940(L)
Q415 Q416 2SC1472K(A)
Q417 Q418 2SD667A(C)
Q419 Q420 2SB647A(C)
Q421 Q422 2SD588A(R)
Q423 Q424 2SB618A(R)
Q2 2SC1419(C)
D15 RD20EB
D17 D18 RD15EB3
D19 RD15EB3
D1 D2 D3 D4 D5 D6 D7 D8 V03C
SW5A SUBSONIC
SW5B SUBSONIC
VR104 100k BASS
Q507 Q508 2SC1344(E)
TE4 SPEAKER SYSTEM-1
TE5 SPEAKER SYSTEM-2
J1 HEADPHONE
SW11 VOLTAGE SELECTOR
T1 POWER
P1 AC100V/120V /220V/240V 50Hz/60Hz
SW1 POWER
CB1 SPEAKER PROTECTOR Rch
CB2 SPEAKER PROTECTOR Lch

SCHEMATIC DIAGRAM REGULAR



SCHEMATIC DIAGRAM REGULAR

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Q301 2SC1344(E)
Q303 Q304 2SA844(E)
Q305 Q306 Q307 Q308 Q309 2SC1344(E)
Q310 2SA844(E)
ME1 TUNING METER
IC203 HA11211
LP108
VR202 4.7k
IC301 HA11223W
D302 GL4AR2 L.E.D. STEREO INDICATOR
D203 SG206D L.E.D. IN TUNE INDICATOR
SW7 FM MUTING
SW101C FUNCTION
PHONO
ST. FM
FM
AM
AUX
D503 SLP132B L.E.D. TAPE MONITOR INDICATOR
SOURCE
SW9D TAPE MONITOR
Q201 Q202 Q203 Q204 Q205 2SC1344(E)
Q302 2SC1344(E)
D10 SLP132B L.E.D. POWER INDICATOR
D13 1SS81
Q2 2SC1419(C)
D15 RD20E8
D17 D18 RD15EB3
D19 RD15EB3
SW5A SUBSONIC
SW5B SUBSONIC
VR104 100k BASS
Q507 Q508 2SC1344(E)
Q401 Q402 Q403 Q404 Q405 Q406 2SC1775(F)
Q407 Q408 Q409 Q410 2SA915(L)
Q411 Q412 Q413 Q414 2SC1940(L)
Q415 Q416 2SC1472K(A)
Q417 Q418 2SD667A(C) Q419 Q420 2SB647A(C)
Q421 Q422 2SD588A(R) Q423 Q424 2SB618A(R)
D401 RD13EB
D402 RD13EB
D403 SIB01-02
D404 SIB01-02
D405 SIB01-02
D406 SIB01-02
D407 MV12Y
D408 MV12Y
D1 D2 D3 D4 D5 D6 D7 D8 V03C
CB1 SPEAKER PROTECTOR Rch
CB2 SPEAKER PROTECTOR Lch
TE4 SPEAKER SYSTEM-1
TE5 SPEAKER SYSTEM-2
SPEAKER 1
SPEAKER 2
J1 HEADPHONE
T1 POWER
SW1 POWER
SO1
P1 AC120V 60Hz
FU1 3A
FU2 6.25A
FU3 6.25A
PL1
PL2
PL3
PL4
PL5
PL6

SCHEMATIC NOTES AND VOLTAGES

NOTES: Unless otherwise specified.

1. All resistors are 1/4 watt, ±5%. Values are in ohms. K=1000 M=1000k.
2. All capacitances values are in MF. PF=MMF.
3. Function selector switch (SW101) is in FM position.

VOLTAGE CHART

AC120V Volume Control at Minimum
No Signal Tone Controls at Mechanical Center
Chassis Ground

+B1 . . . . . +38V
-B1 . . . . . -38V

+B2 . . . . . +38V
-B2 . . . . . -38V
B3 . . . . . +13.6V

FM POSITION

	base	emitter	collector
Q1	-0.63V	0V	0V
Q2	+14.2V	+13.6V	35V
Q3	-20.0V	-19.4V	-26.3V
Q102	+1.8V	+1.3V	+12.3V
Q103	+4.5V	+4.0V	+7.4V
Q201	+0.16V	0V	+0.9V
Q202	+0.69V	0V	0V
Q203	0V	0V	+11.9V
Q204	0V	0V	+7.1V
Q205	+0.66V	0V	+0.05V
Q301	+0.05V	0V	+12.4V
Q302	+0.13V	0V	+13.5V
Q303, 304	+10.0V	+11.6V	-12.4V
Q305, 306	-12.4V	-13.0V	-2.5V
Q307, 308	+2.4V	0V	0V
Q309	0V	-0.6V	+13.6V
Q310	+13.5V	+13.6V	+0.13V
Q401, 402	-0.04V	-0.62V	+36.0V
Q403, 404	-0.03V	-0.62V	+36.0V
Q405, 406	-25.3V	-25.9V	-0.7V
Q407, 408	+36.0V	+36.6V	-8.0V
Q409, 410	+36.0V	+36.6V	+1.2V
Q411, 412	-36.4V	-36.8V	-36.4V
Q413, 414	-36.4V	-36.8V	-1.15V
Q415, 416	-0.5V	-1.15V	+1.2V
Q417, 418	+1.15V	+0.6V	+38.0V
Q419, 420	-1.12V	-0.6V	-38.0V
Q421, 422	+0.6V	+0.02V	+38.0V
Q423, 424	-0.6V	-0.01V	-38.0V
Q501, 502	0V	-0.6V	+11.0V
Q503, 504	0V	-0.6V	+15.0V
Q505, 506	+11.0V	+11.6V	0V
Q507, 508	-0.5V	-1.1V	+15.0V
Q701, 702	0V	-0.6V	+18.9V
Q703, 704	+18.9V	+19.5V	+3.5V
Q705, 706	+3.5V	+2.8V	+19.5V
Q707, 708	-18.0V	-18.6V	+2.6V

AM POSITION

	base	emitter	collector
Q251	+0.93V	+0.33V	+12.7V
Q252	+1.8V	+1.2V	+4.6V
Q253	+11.0V	+11.6V	+6.5V

IC201

1. . . . . +1.4V
2. . . . . +1.4V
3. . . . . 0V
4. . . . . +9.5V
5. . . . . +10V

IC202

1. . . . . +1.3V
2. . . . . +1.3V
3. . . . . 0V
4. . . . . +9.5V
5. . . . . +10V

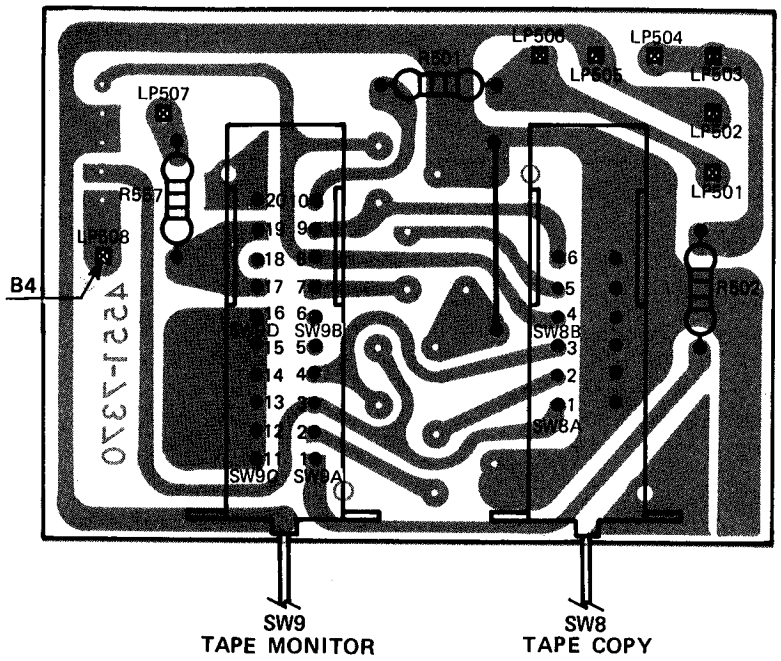
IC301

1. . . . . +13.8V
2. . . . . +3.5V
3. . . . . +4.8V
4. . . . . +0.7V
5. . . . . +10.0V
6. . . . . +10.0V
7. . . . . 0V
8. . . . . 0V
9. . . . . +5.5V
10. . . . . +2.7V
11. . . . . +2.7V
12. . . . . +2.7V
13. . . . . +2.7V
14. . . . . +2.7V
15. . . . . +4.3V
16. . . . . +3.0V

IC203

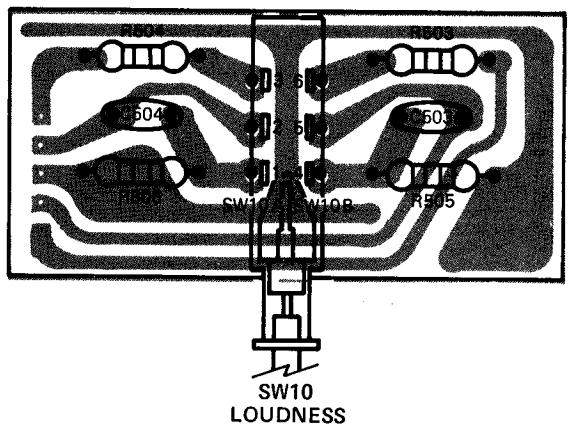
	FM	AM
1.	+2.6V	+2.6V
2.	0V	0V
3.	+3.4V	+3.4V
4.	+0.7V	+0.7V
5.	0V	0V
6.	+2.0V	+2.7V
7.	+2.0V	+2.7V
8.	+2.0V	+2.7V
9.	0V	.0V
10.	+5.0V	+5.2V
11.	+11.8V	+11.7V
12.	+5.6V	+5.6V
13.	+5.6V	+5.6V
14.	+5.6V	+5.6V
15.	+7.4V	+6.5V
16.	+7.4V	+6.6V
17.	0V	0V
18.	0V	0V

TAPE COPY/TAPE MONITOR SWITCH PC BOARD



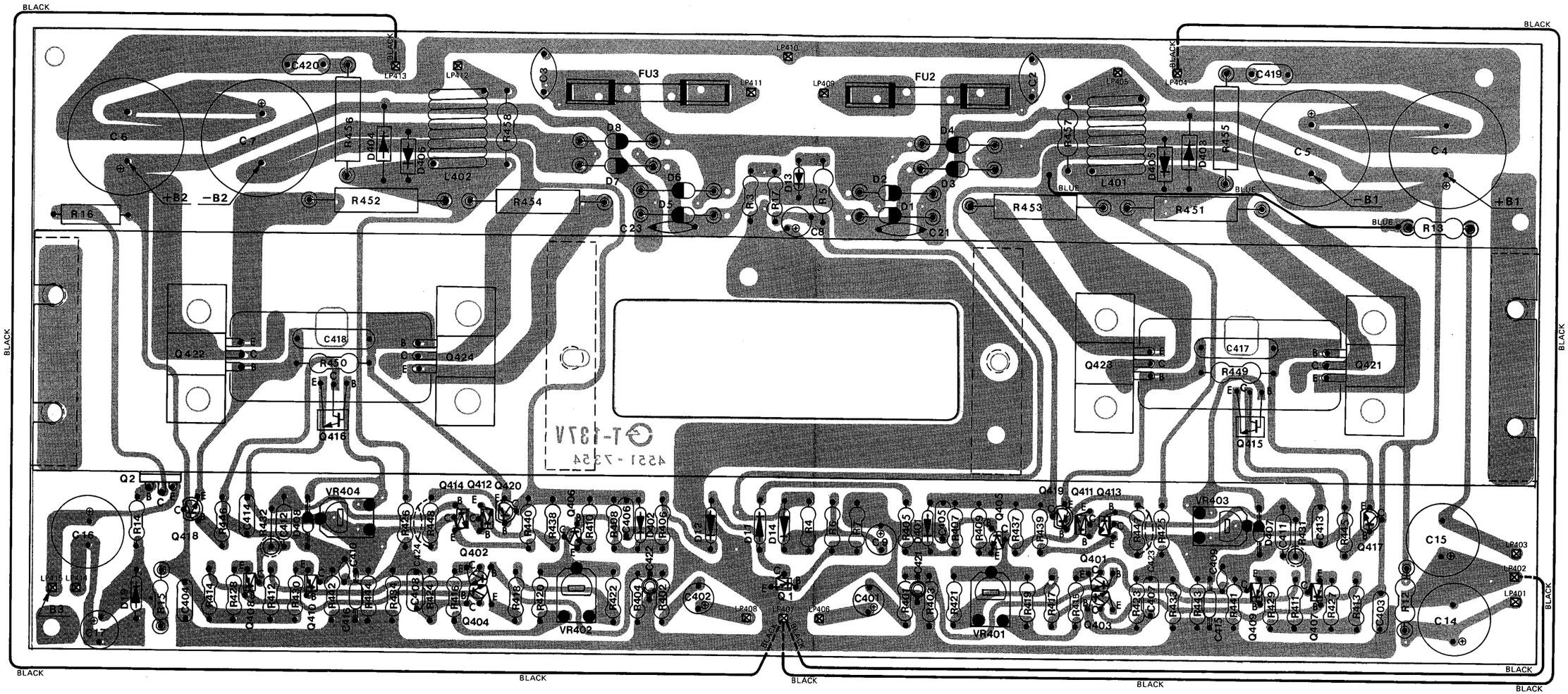
CIRCUIT REF.	H/K PART NO.	DESCRIPTION
SW6	26535632	Lever Switch, Tape Monitor

LOUDNESS SWITCH PC BOARD



CIRCUIT REF.	H/K PART NO.	DESCRIPTION
SW7	25035633	Push Switch, Loudness

MAIN AMP/RECTIFIER PC BOARD

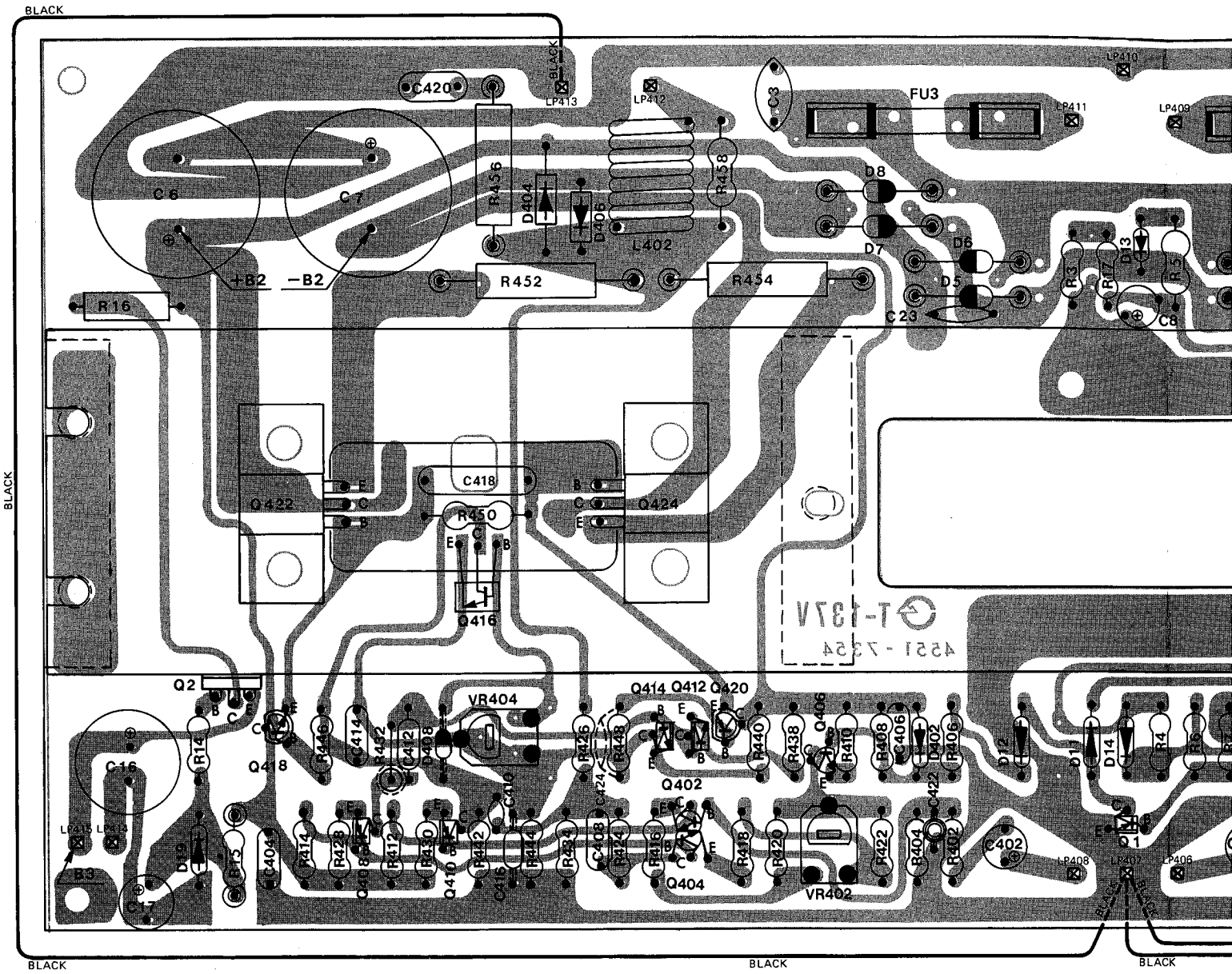


CIRCUIT REF.	H/K PART NO.	DESCRIPTION
RESISTORS		
VR401, 402	23535613	Variable Resistor, 100 ohm
VR403, 404	23535614	Variable Resistor, 2 k ohm
CAPACITORS, ELECTROLYTIC		
C4, 5, 6, 7	31535660	4700 MF +30% −10% 50V
C8	31835661	33 MF ±20% 16V
C9	31835662	47 MF ±20% 10V
C14, 15	31835617	470 MF +50% −10% 35V
C16	31835618	1000 MF +50% −10% 16V
C17	31835571	330 MF +50% −10% 16V
C401, 402	31835619	100 MF +50% −10% 10V

CIRCUIT REF.	H/K PART NO.	DESCRIPTION
TRANSISTOR		
Q1	43031312	2SA844(E) Audio Muting
Q2	43035620	2SC1419(C) Voltage Regulator
Q401, 402, 403, 404, 405, 406	43035592	2SC1775(F) Differential Amp., Current Regulator
Q407, 408, 409, 410	43035621	2SA915(L) Differential Amp.
Q411, 412, 413, 414	43035622	2SC1940(L) Current Regulator
Q415, 416	43035623	2SC1472K(A) Bias Stabilization
Q417, 418	43035624	2SD667A(C) Driver
Q419, 420	43035625	2SB647A(C) Driver
Q421, 422	43035623	2SD588A(R) Power Amp.
Q423, 424	43035664	2SB618A(R) Power Amp.

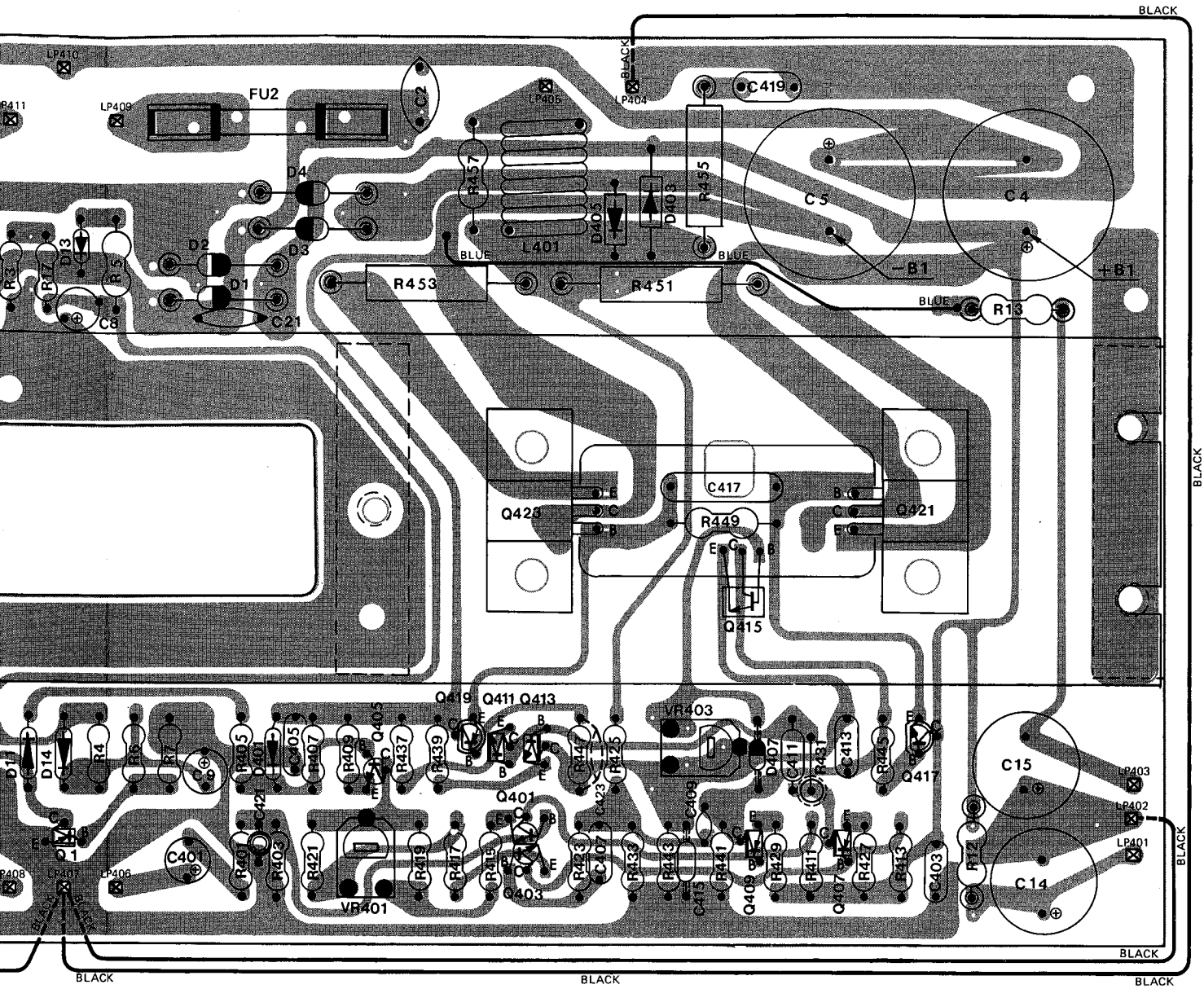
CIRCUIT REF.	H/K PART NO.	DESCRIPTION
DIODE		
D1, 2, 3, 4, 5, 6, 7, 8	41035665	VO3C
D11, 12, 13, 14	41035628	1SS81
D19	42035595	Zener, RD15EB3 14.72V ±0.37V
D401, 402	42032760	Zener, RD13EB 13.2V ±0.8V
D403, 404, 405, 406	41631295	SIB01-02
D407, 408	41035666	Variator, MV12Y
COIL		
L401, 402	12035630	RF Choke

MAIN AMP/RECTIFIER PC BOARD



CIRCUIT REF.	H/K PART NO.	DESCRIPTION
RESISTORS		
VR401, 402	23535613	Variable Resistor, 100 ohm
VR403, 404	23535614	Variable Resistor, 2 k ohm
CAPACITORS, ELECTROLYTIC		
C4, 5, 6, 7	31535660	4700 MF +30% −10% 50V
C8	31835661	33 MF ±20% 16V
C9	31835662	47 MF ±20% 10V
C14, 15	31835617	470 MF +50% −10% 35V
C16	31835618	1000 MF +50% −10% 16V
C17	31835571	330 MF +50% −10% 16V
C401, 402	31835619	100 MF +50% −10% 10V

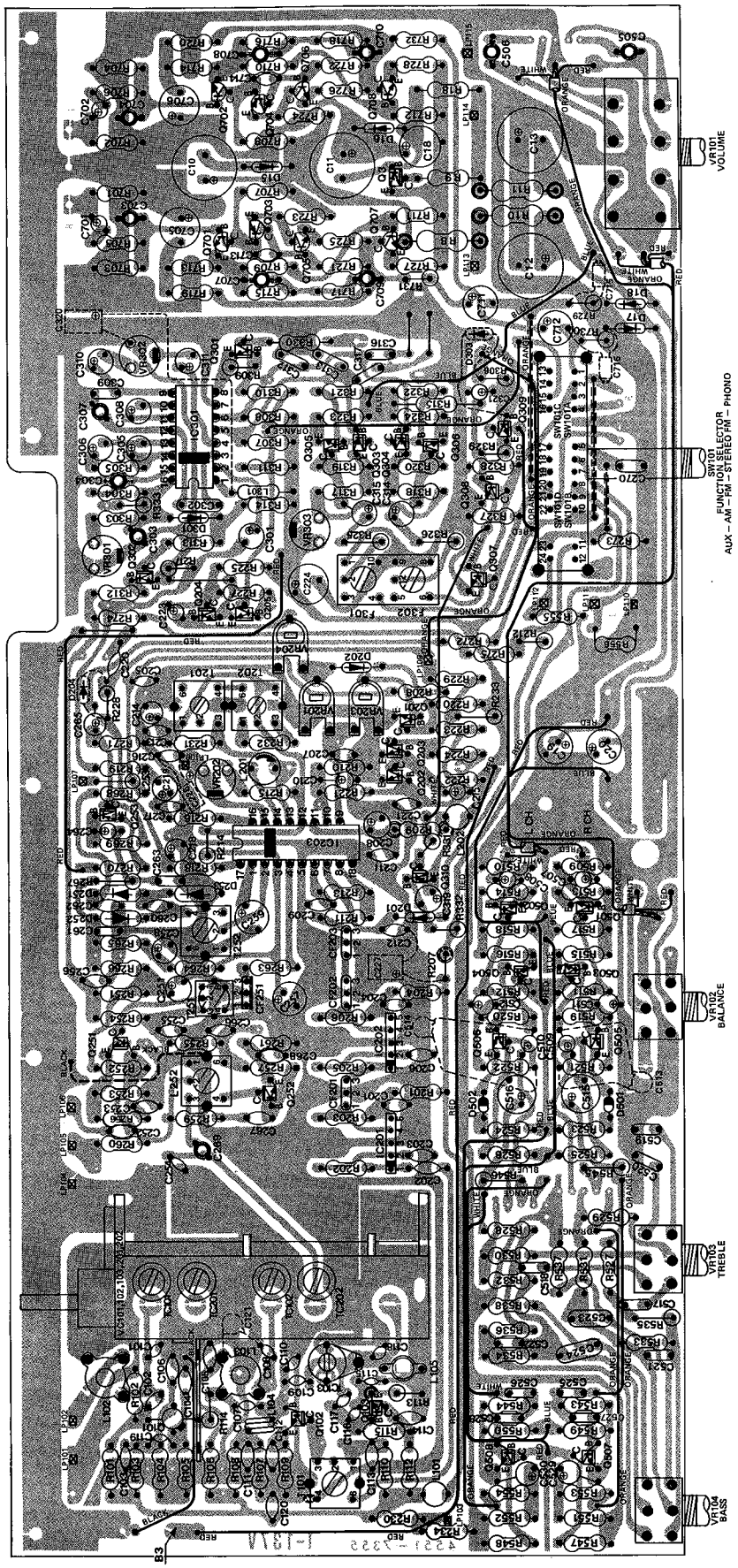
CIRCUIT REF.	H/K PART NO.	DES
TRANSISTOR		
Q1	43031312	2SA
Q2	43035620	2SC
Q401, 402, 403, 404, 405, 406	43035592	2SC Cur
Q407, 408, 409, 410	43035621	2SA
Q411, 412, 413, 414	43035622	2SC
Q415, 416	43035623	2SC
Q417, 418	43035624	2SD
Q419, 420	43035625	2SB
Q421, 422	43035623	2SD
Q423, 424	43035664	2SB



ART NO.	DESCRIPTION
312	2SA844(E) Audio Muting
520	2SC1419(C) Voltage Regulator
592	2SC1775(F) Differential Amp., Current Regulator
521	2SA915(L) Differential Amp.
522	2SC1940(L) Current Regulator
523	2SC1472K(A) Bias Stabilization
524	2SD667A(C) Driver
525	2SB647A(C) Driver
523	2SD588A(R) Power Amp.
564	2SB618A(R) Power Amp.

CIRCUIT REF.	H/K PART NO.	DESCRIPTION
DIODE		
D1, 2, 3, 4, 5, 6, 7, 8	41035665	VO3C
D11, 12, 13, 14	41035628	1SS81
D19	42035595	Zener, RD15EB3 14.72V ±0.37V
D401, 402	42032760	Zener, RD13EB 13.2V ±0.8V
D403, 404, 405, 406	41631295	SIB01-02
D407, 408	41035666	Variator, MV12Y
COIL		
L401, 402	12035630	RF Choke

TUNER/EQUALIZER AMP/PRE AMP PC BOARD



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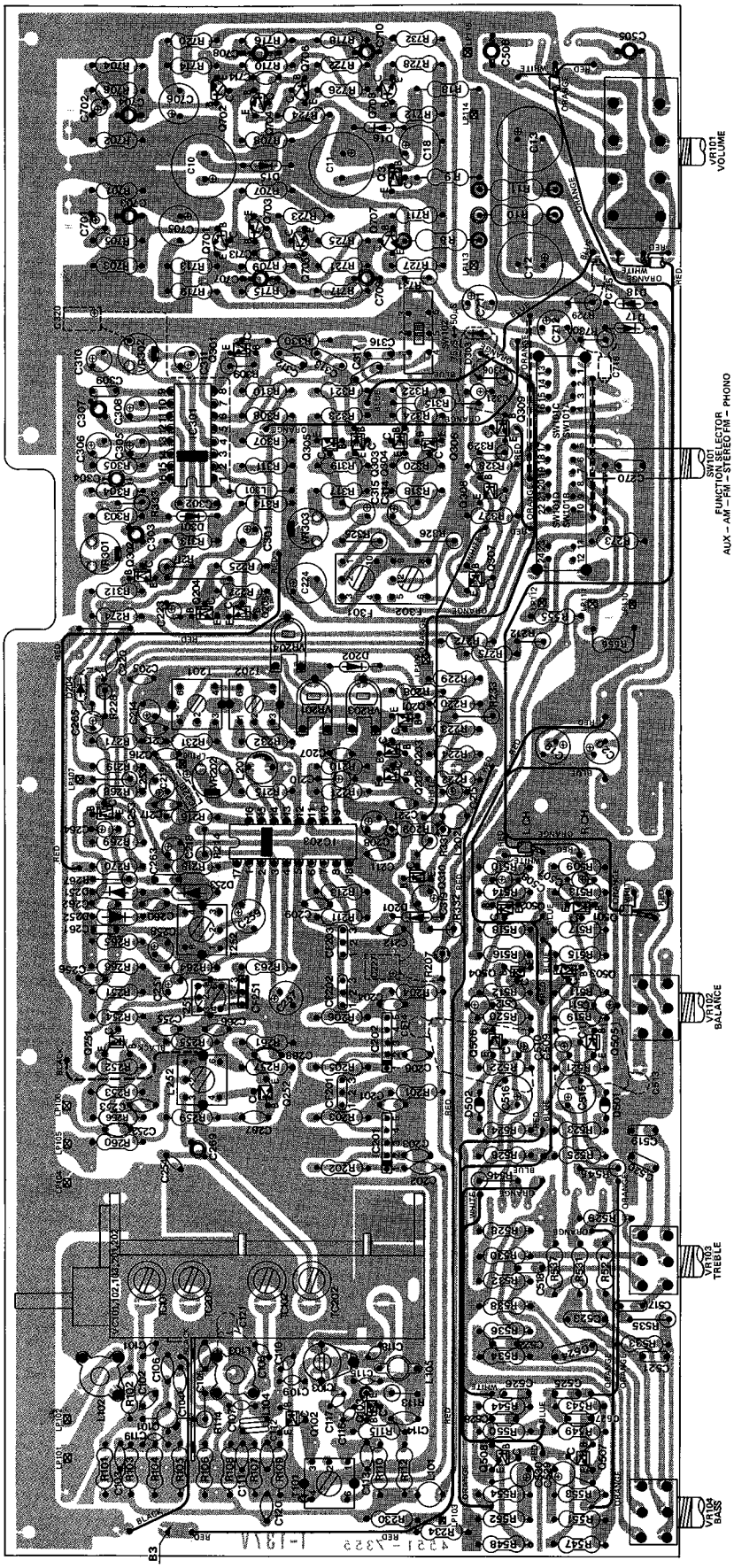
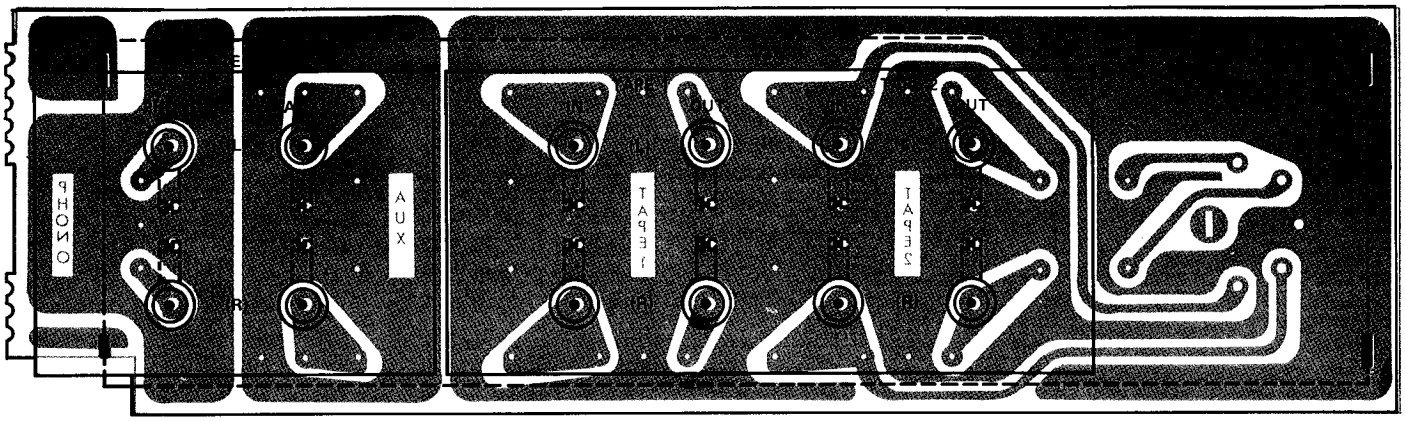
TUNER/EQUALIZER AMP/PRE AMP PC BOARD MULTI



CIRCUIT REF.	H/K PART NO.	DESCRIPTION
RESISTORS		
VR101	22035651	Variable Resistor, 100k ohm, Volume Control
VR102	22035652	Variable Resistor, 50 k ohm, Balance Control
VR103, 104	22035653	Variable Resistor, 100 k ohm, Treble and Bass Control
VR201	23535566	Variable Resistor, 10 k ohm
VR202	23535567	Variable Resistor, 4.7 k ohm
VR203	23535654	Variable Resistor, 20 k ohm
VR204	23535568	Variable Resistor, 50 k ohm
VR301	23535569	Variable Resistor, 3.3 k ohm
VR302	23535570	Variable Resistor, 33 k ohm
VR303	23532130	Variable Resistor, 220 ohm
CAPACITORS, ELECTROLYTIC		
C10, 11, 12, 13	31835655	330 MF +50% −10% 25V
C18	31835656	22 MF +50% −10% 25V
C19, 20	31835572	22 MF +50% −10% 16V
C208, 218	31835573	10 MF +50% −10% 16V
C210, 226	31835574	1 MF +75% −10% 50V
C214	31835582	47 MF +50% −10% 16V
C215, 223	30731310	0.1 MF ±20% 35V Tantalum
C219	31835576	4.7 MF +50% −10% 25V
C224, 227	31835577	220 MF +50% −10% 16V
C251, 258	31835576	4.7 MF +50% −10% 25V
C257, 265	31835574	1 MF +75% −10% 50V
C259	31835578	3.3 MF +75% −10% 25V
C264	30731310	0.1 MF ±20% 35V Tantalum
C301	31835657	2.2 MF ±20% 50V
C305	31835580	0.47 MF ±20% 50V
C306, 308, 310, 311	31835581	0.33 MF ±20% 50V
C314, 315	31835576	4.7 MF +50% −10% 25V
C319	31835575	47 MF +50% −10% 10V
C320	31835582	47 MF +50% −10% 16V
C321	31835573	10 MF +50% −10% 16V
C507, 508, 509, 510	31835583	10 MF ±20% 6.3V Tantalum
C511, 512	31835658	3.3 MF ±20% 16V
C515, 516	31835582	47 MF +50% −10% 16V
C529, 530	31835584	10 MF ±20% 16V
C701, 702	31835586	33 MF ±20% 6.3V Tantalum
C705, 706	31835587	330 MF +50% −10% 6.3V
C711, 712	31835588	4.7 MF ±20% 25V
VC101, 102, 103, 201, 202	30834831A	Variable Capacitor (w/Trimmers TC101, 102, 201, 202)
TRANSISTOR		
Q3	43031312	Transistor, 2SA844(E) Voltage Rectifier
Q101	43035590	F. E. T., 3SK45(B) FM RF Amp.
Q102, 103	43034834A	Transistor, 2SC535(B) FM Mixer, FM Osc.
Q201, 202, 203 204, 205	43028535	Transistor, 2SC1344(E) In Tune Indicator Driver, Stereo Indicator Driver
Q251, 252	43035591	Transistor, 2SC461(B) AM Mixer, AM Osc.

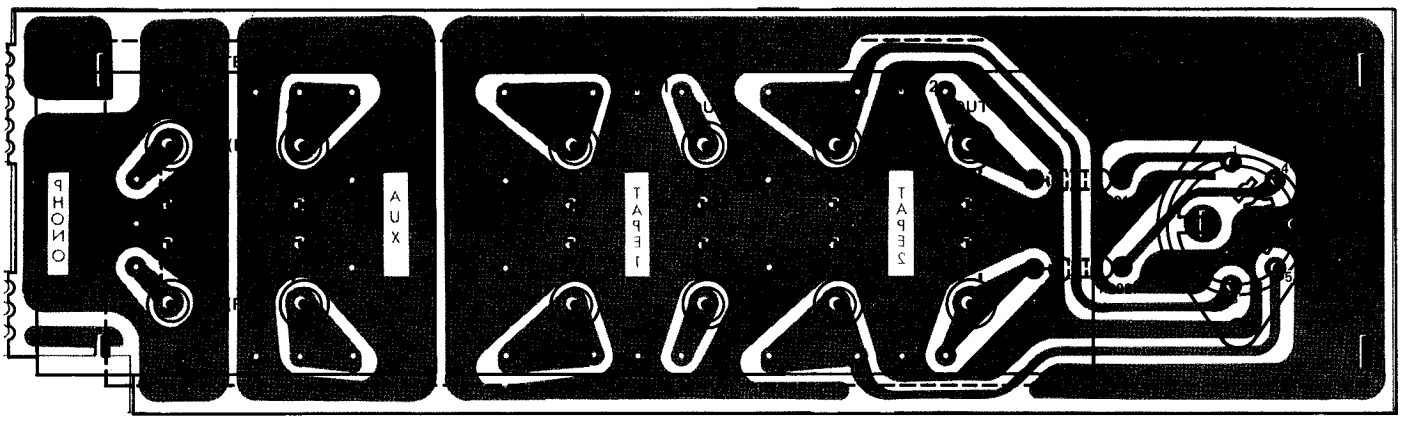
CIRCUIT REF.	H/K PART NO.	DESCRIPTION
TRANSISTORS (continued)		
Q253	43031312	Transistor, 2SA844(E) AM Output Amp.
Q301, 302, 305, 306, 307, 308, 309	43028535	Transistor, 2SC1344(E) Stereo/Mono Switching, MPX Osc Stop Switching, MPX Output Amp., FM Muting Switching, Tuning Muting Driver
Q303, 304, 310	43031312	Transistor, 2SA844(E) MPX Output Amp., Switch Muting Driver
Q501, 502, 503, 504	43028535	Transistor, 2SC1344(E) Pre. Amp.
Q505, 506	43031312	Transistor, 2SA844(E) Pre. Amp.
Q507, 508	43028535	Transistor, 2SC1344(E) Tone Control Amp.
Q701, 702	43035592	Transistor, 2SC1775(F) Equalizer Amp.
Q703, 704	43032151	Transistor, 2SA872(E) Equalizer Amp.
Q705, 706, 707, 708	43035592	Transistor, 2SC1775(E) or (F) Equalizer Amp.
IC201, 202	43131313	Integrated Circuit, BA401 FM IF Amp.
IC203	43135593	Integrated Circuit, HA11211 FM IF Amp./ FM Det./AM IF Amp.
IC301	43135594	Integrated Circuit, HA11223W FM Multiplex
D15, 16	42035659	Zener Diode, RD20EB 20V ±1.2V
D17, 18	42035595	Zeenr Diode, RD15EB3 14.72V ±0.37V
D201, 202, 204	41028593	Diode, 1S2076
D251, 252, 253	41528591	Diode, IN34A
D301, 303	41028593	Diode, IS2076
D501, 502	38128520	Variator, MV11
COILS		
L101	12035596	Coil, Choke
L102	12035597	Coil, FM RF
L103	12035598	Coil, FM RF
L104	12034838	Coil, FM IF Trap
L105	12033599	Coil, FM Osc.
L201	12035600	Coil, Phase Shifter
L202	12035596	Coil, Bypass Filter
L252	12035602	Coil, AM Osc.
L253	12035603	Coil, Choke
L301	12035603	Coil, Choke
TRANSFORMERS		
T101	11035604	Transformer, FM IF
T201	11035605	Transformer, Quadrature Det.
T202	11034606	Transformer, Quadrature Det.
T251	11035607	Transformer, AM IF
T252	11035608	Transformer, AM IF
MISCELLANEOUS		
CF201, 202, 203	12035609	Ceramic Filter, FM IF
CF251	12035610	Ceramic Filter, AM IF
F301, 302	12035611	L. C. Component, Low Pass Filter
SW101	24035612	Rotary Slide Switch, Function Selector

INPUT/OUTPUT JACK TERMINAL PC BOARD

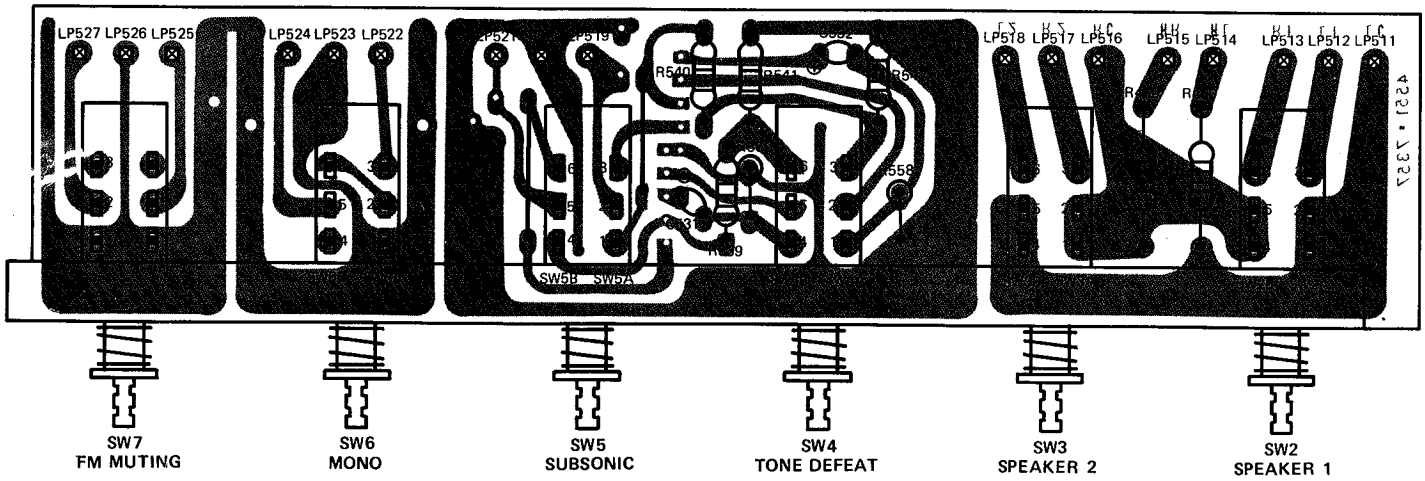


CIRCUIT REF.	H/K PART NO.	DESCRIPTION
SWITCH PUSHBUTTON		
	31835667	Capacitor, 2.2 MF ±20% 16V Tantalum Electrolytic
SW2, 3, 4, 5 6, 7	25035668	Speaker 1/Speaker 1/Speaker 2/Tone Defeat/Subsonic/Mono/FM Muting

INPUT/OUTPUT JACK TERMINAL PC BOARD MULTI

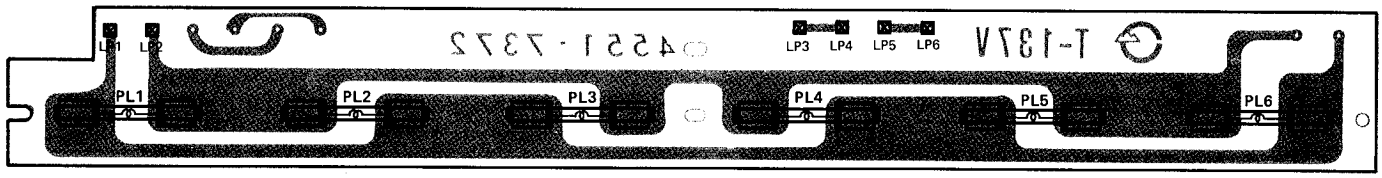


MODE/CONTROL SWITCH PC BOARD



CIRCUIT REF.	H/K PART NO.	DESCRIPTION
CONNECTOR		
TE2	65435670	4-Pin Jack, Phono/Aux.
TE3	65433652	C-Pin Jack Tape 1 and 2 Input/Output

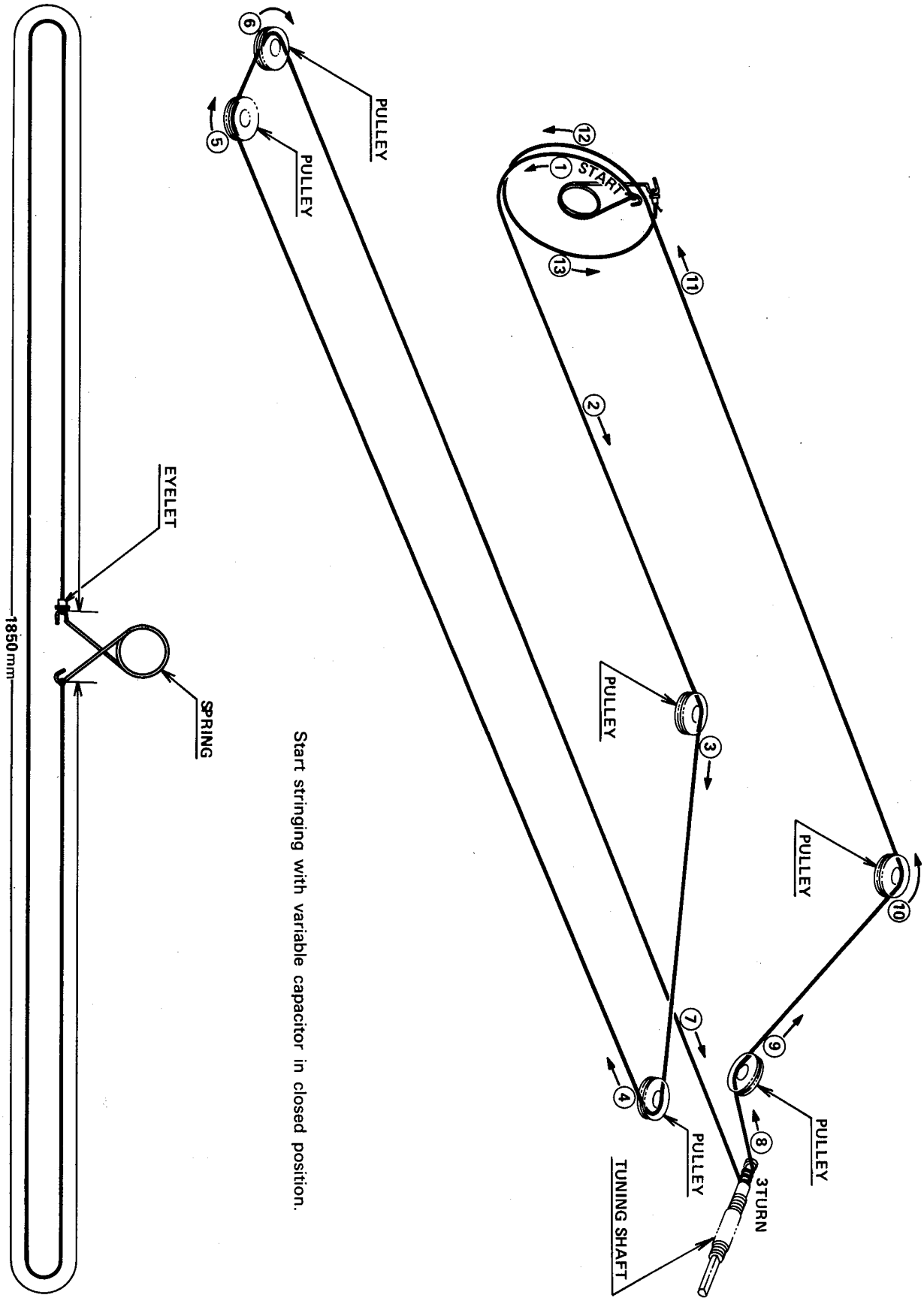
LAMP HOLDER PC BOARD



CHASSIS PARTS LIST

CIRCUIT REF.	H/K PART NO.	DESCRIPTION
GENERAL UNIT		
101	00235640	Clear Panel Assembly
102	00235641	Front Panel Assembly
103	00135642	Push Button Assembly, Speaker 1/Speaker 2/Tone Defeat/ Subsonic/Mono/FM Muting/ Loudness (x 7)
104	00235643	Knob Assembly, Bass/Treble/Balance Function Selector (x 4)
105	00235644	Knob Assembly, Tuning
106	00235645	Dial Pointer Assembly (Includes: In Tune Indicator (D203))
115	60135646	Cabinet Back
116	60135543	Cabinet Top
117	62035544	Foot, Cabinet Bottom (x 4)
119	60135545	Dial Panel
121	64235546	Bracket, Clear Panel
122	64235547	Barcket, Front Panel Right
123	64235548	Bracket, Front Panel Left
146	60135549	Dressing Plate, Cabinet Back
149	63235550	Knob Assembly, Volume
161	63235552	Knob Assembly, Tape Copy/Tape Monitor (x 2)
169	63233663	Push Button Assembly, Power
ELECTRICAL		
T1	10135647	Power Transformer
SW1	25035554	Push Switch, Power
ME1	12535555	Tuning Meter
J1	65432119	Headphones Jack
SO1	67435556	External AC Socket, Switched
CB1, 2	45535648	Speaker Protector
TE1	65129518	FM/AM External Antenna Terminal
TE4, 5	65434823A	Speaker Output Terminal
FU1	45035558	Fuse, 3A 125V
FU2, 3	45045649	Fuse, 6.25A 125V
D10, 503	46735556	Light Emitting Diode, SLP132B Power Indicator, Tape Monitor Indicator
D203	46735650	Light Emitting Diode, SG206D In Tune Indicator
D302	46735561	Light Emitting Diode, GL4AR2 Stereo Indicator
L106	12031333	FM Antenna Coil
L251	20535562	AM Ferrite Bar Antenna
PL1, 2, 3, 4, 5, 6	46529502	Dial Illuminator Lamp, 8V 300mA
MULTI VOLTAGE RECEIVER		
T1	10135671	Power, Transformer, MV
SW1	25035635	Push Switch, Power
FU1, 4	45035636	Fuse, 3.15AT 250V
FU2, 3	45035751	Fuse, 5AT 250V
SW11	24035639	Rotary Switch, Power Source Voltage Selector
SW102	24531335	Slide Switch, Emphasis
J2	65432127	5-Pin DIN Jack, REC/PB

DIAL CORD STRINGING



Start stringing with variable capacitor in closed position.

harman/kardon

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